

D. W. J.

ONTARIO WATER RESOURCES COMMISSION



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OWRC
1962
APHG

ANNUAL REPORT

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE CHAIRMAN

March 6th, 1963

To the Honorable J. W. Spooner,
Minister of Municipal Affairs.

Sir,-- I have the honor to submit for your approval
the Seventh Annual Report of the Ontario Water Resources
Commission, made in conformity with and under provisions
of the Ontario Water Resources Commission Act.

I have the honor to be, Sir,

Your obedient servant,

A handwritten signature in cursive script, reading "A. M. Snider".

Chairman.



ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

March 5th, 1963

A. M. Snider, Esq.,
Chairman,
Ontario Water Resources Commission,
801 Bay Street,
Toronto 5, Ontario.

Dear Sir:

It is with pleasure that I present to you and
the other Commissioners of the Ontario Water Resources
Commission this, the Seventh Annual Report of the
Commission.

Yours sincerely,

A handwritten signature in cursive script, reading "A. E. Cherry".
General Manager and
Chief Engineer.



SEVENTH
ANNUAL REPORT

1962

Ontario Water Resources Commission
801 Bay Street
Toronto

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INTRODUCTION
by
Dr. A.E. Berry
General Manager and Chief Engineer

It is gratifying in this Seventh Annual Report of the Ontario Water Resources Commission to place on record a continuing program of advancement in the various activities undertaken. The year was an active one. New programs were initiated, and advances were made in many directions. The construction of water and sewage projects continued at a very high rate, and the expenditures involved in the certificates of approval for such projects issued by the Commission reached an all time record, in excess of \$147 millions. Since the major portion of this was on sewerage works, it will be noted that this was designed to protect the water resources of the province and to provide a more sanitary environment for communities. Emphasis also was placed on supervision of water supplies and the provision of this utility to the smaller municipalities, as well as extensions in those urban centres where growth was pronounced. The Ontario Water Resources Commission Act again was amended, and new programs resulted therefrom. A summary of the major activities of the Commission is referred to in this introductory statement.

The personnel of the Commission throughout the year continued as previously--A. M. Snider, Waterloo, Chairman; Commissioners, W. D. Conklin, Q.C., Kingsville; John H. H. Root, M.P.P., Orton; R. M. Simpson, Arnprior; Dr. J. A. Vance, Woodstock; and A. A. Wishart, Q.C., Sault Ste. Marie. The resignation of Commissioner Simpson took place at the end of 1962.

Amendments adopted in 1962, came into effect March 30, and following that, advances were made in that new part of the legislation dealing with the control of chemicals introduced into water supplies, and in the requirements for permits for taking water from surface or underground sources.

Administration of the Commission

No major changes were made during the year in the organization of the Commission. The organization chart shows, in addition to the administrative branches, six major divisions, namely Sanitary Engineering, Research, Construction, Plant Operations, Water Resources and Laboratories. The Research Division, created the previous year, had not been staffed at the close of 1962, and research work was carried on under the direction of the different divisions of the Commission. Some alterations were made in the organization and the accompanying chart, as of October 1st 1962, reveals the Commission set-up.

At the end of the year, the staff of the Commission consisted of 300 head office and laboratories personnel in comparison with 266 at the close of 1961, and 214 at the end of 1960. This gradual increase was made necessary by new activities undertaken by the Commission and by extension of existing programs. There was substantial growth in the construction of water and sewage projects

ORGANIZATION CHART

ONTARIO WATER RESOURCES COMMISSION

A. M. SNIDER - CHAIRMAN

ASSISTANT
GENERAL MANAGER

GENERAL MANAGER
DR. A. E. BERRY

ASSISTANT
GENERAL MANAGER

EXECUTIVE OFFICER
ENGINEERING

EXECUTIVE OFFICER
SECRETARY

ADMINISTRATIVE BRANCHES

CONTRACTS

PROJECT CONTROL

PROPERTY

LEGAL SERVICES

FINANCES

PERSONNEL

PURCHASING

PUBLIC
INFORMATION

MAINTENANCE
AND
MECHANICAL SERVICES

STORES

PRINTING

DIVISIONS AND BRANCHES

SANITARY
ENGINEERING

RESEARCH

CONSTRUCTION

PLANT
OPERATIONS

WATER
RESOURCES

LABORATORIES

WATER
WORKS

SEWAGE
WORKS

FIELD
ACTIVITIES

STREAM
SANITATION

SEWAGE
AND
WATER WORKS

WATER
WORKS

SEWAGE
WORKS

GROUND
WATERS

SURFACE
WATERS

CHEMISTRY

BACTERIOLOGY

BIOLOGY

PLAN
CHECKING

DISTRICT
ENGINEERS

PLUMBING

INDUSTRIAL
WASTES

PURIFICATION
PROCESSES

throughout the province, and since many of these were undertaken by the Commission, additional staff was needed to supervise these works. In addition to the head office and laboratories staff, the number of plant operators under the direction of the Division of Plant Operations reached 162, at the end of the year, compared with 145 the previous year, and 92 at the close of 1960. This reflects in some measures the growth in OWRC projects.

Difficulties were experienced during the year in obtaining sufficient personnel with the required specialized training. It was again the policy of the Commission to participate in the training program offered by the federal administration for sanitary engineers, and during this time seven graduates completed their masters degrees at the University of Toronto. Other means were adopted to provide the special training needed by those members of the staff doing technical work. During the year a grievance procedure was adopted by the Commission similar to that available for the civil service in general. The adoption of this voluntarily by the Commission, offered the staff the same facilities for adjustment of grievances as the civil service of the province.

Distinguished Service Awards

The Commission continued its policy of recognizing persons who had given outstanding service in the field of water resources and pollution abatement. In 1960 the Commission established Distinguished Service Awards for this purpose, and in that year presented awards to three persons, while in 1961 two persons were so recognized. In 1962, three persons were named to receive these awards--Peter King of Sault Ste. Marie; Dr. L.W.C. Sturgeon, Welland and District Health Unit; and Dr. Hugh Templin, Fergus. All had made marked contributions in the fields embraced by the activities of the Commission.

Summary of Significant Activities

The report of each division of the Commission contains an outline of the main features involved in its year's program. These revealed marked progress in all directions. The activities to which significant attention was given are seen in the report of each director.

Certificates for Water and Sewage Works

Under The Ontario Water Resources Commission Act, municipalities intending to build new water or sewage works, or make extensions to existing ones, must first obtain the approval of the Commission. These applications are reviewed by the Sanitary Engineering Division, and, when found to be satisfactory, the appropriate certificates of approval are issued. The number of these certificates issued, along with estimated expenditures, are an indication of the extent of work being carried on throughout the province. It is gratifying to observe that in 1962 the highest expenditure on record for water and sewage works was involved in these certificates of approval. The number of certificates reached a total of 1,692, with estimated expenditures for these works reaching the high figure

of \$147,754,376.81

A comparison of the annual number of certificates issued and expenditures since the formation of the Commission in 1956 is revealed in the following table.

<u>Year</u>	<u>No. of Certificates</u>	<u>Estimated Expenditures</u>
1956	1,587	102,245,083.24
1957	1,502	98,409,145.32
1958	1,594	109,520,133.19
1959	1,975	115,726,003.00
1960	1,697	111,037,642.58
1961	1,603	107,027,062.42
1962	1,692	147,754,376.81

The annual average of these expenditures since the creation of the Commission was \$113,102,778.08 not including, however, a number of other expenditures for water and sewage works which do not require Commission approval. Prior to the formation of the Commission it was estimated that in the ensuing 20 years an expenditure of approximately \$2.4 billion would be needed for these works throughout the province, or an average of \$120,000,000 per year. It is interesting to observe that the figures for the first seven years of this period were close to the original estimate. Much of this expenditure resulted from the program for pollution abatement, involving the construction of trunk sewers and sewage treatment facilities.

A breakdown of the 1962 figures reveals:

	<u>Certificates</u>	<u>Expenditures</u>
Water Works	704	51,643,155.53
Sewage Works	988	96,111,221.28
Total	1,692	\$147,754,376.81

Details of all certificates issued are included in the report of the Division of Sanitary Engineering.

OWRC Projects

Commission projects for the construction of water and sewage works are undertaken when agreements are made with municipalities. This program, in effect since 1957, is entirely a voluntary one in which a municipality may choose to have the Commission undertake the construction, financing, and operation of water supply and purification works, and trunk sewers and sewage treatment facilities. During the year 1962, 185 certificates were issued for OWRC projects amounting to a total estimated expenditure of \$27,436,297.97. These figures may be compared with 155 certificates for a total of \$19,884,870.77 in 1961, and 124 certificates in 1960 for a total expenditure of \$16,068,113.74. These 1962 certificates included 58 water works at a total estimated cost of \$4,488,164.47, and 127

certificates for sewage works at a total estimated cost of \$22,948,133.50. Thus there was a substantial increase during the year in the work undertaken by the Commission to serve municipalities. The figures for Commission projects since this work was initiated in 1957, follow:

<u>Year</u>	<u>No. of Certificates Issued</u>	<u>Estimated Expenditures</u>
1957	26	\$ 7,122,200.50
1958	49	12,950,368.50
1959	117	16,274,984.94
1960	124	16,068,113.94
1961	155	19,884,870.77
1962	185	27,436,297.97

OWRC Construction Program

It will be seen that project construction agreements between the Commission and the municipalities continued to increase. In these agreements the facilities of the Commission are made available for the design, construction, financing, and operation of works in these fields. At the end of 1962 these projects totalled 239 for an estimated expenditure of \$102,777,688. Expenditures on sewage works continued to rise more rapidly than those on water works even though the number of projects in each was not greatly different. While a number of projects were for municipalities where the Commission had already undertaken certain works, the total of 239 projects at the end of the year involved 172 municipalities, as compared with 146 municipalities at the end of 1961.

The OWRC projects are listed herewith with special designations to show those in operation, those under construction, as well as others which are in the development stages, such as the preparation of engineering plans and specifications.

OWRC Projects, December 31, 1962

x - in operation y - under construction td - test drilling
* - CMHC/OWRC Projects y/ - in partial operation

(S2)(W2) indicates a second sewage or water project for a municipality.

TOTAL WATER PROJECTS	105	
TOTAL SEWAGE PROJECTS	134	Involving 172 Municipalities.
TOTAL PROJECTS	239	

W A T E R W O R K S

S E W A G E W O R K S

	<u>Actual or Estimated Cost</u>		<u>Actual or Estimated Cost</u>
x Acton	\$ 177,000	y Alexandria*	\$ 193,690
x Alfred	139,350	y Almonte*	239,000

x Ancaster	192,719	y Arthur Vill.*	\$ 179,916
Anson, Hindon & Minden	135,000	x Aylmer*	467,000
x Bancroft	243,341	x Bancroft	114,643
x Bath Village	39,515	x Barrie	307,836
x Beaverton	9,176	y Belleville*	2,224,978
Beaverton (W2)	83,000	x Bracebridge*	421,274
x Belle River	55,649	x Bradford	282,125
x Bertie Twp. (W1)	828,620	x Brampton/Chingacousy	1,360,000
x " " (W2)	61,600	x Brampton (S2)	129,766
x Blind River	30,918	x Brantford City	2,251,053
x Bolton	62,251	x Burlington	390,484
x Bracebridge Area	77,326	x " (S2)	683,821
x Bradford	158,000	y " (S3)*	2,100,000
x Brampton	273,357	y " (S4)*	745,000
y Brampton (W2)	546,700	Chatham *	4,261,000
y Brantford Twp. (W1)	245,000	x Chelmsford & Ext.	296,211
" (W2)	121,312	y Chesley*	268,280
x Brock Twp. (Sunderland)	100,328	x Coniston	472,784
x Caledon East	106,800	x Coniston (S2)	31,476
Campbellford	135,000	Cornwall*	175,000
td Cannington	4,446	yx Cumberland	58,000
x Chesterville	292,424	Elmira*	15,000
td Clarke Twp. (Orono)	7,258	y Elmvale	180,000
y Cookstown	142,000	Elora*	620,000
x Cumberland Twp.	186,969	Englehart	4,440
td Deseronto	12,000	x Espanola*	615,301
x Dresden	171,969	y Exeter	344,000
x " (W2)	18,083	Fauquier Twp. (Moonbeam)	69,735
x " (W3)	114,173	x Fergus	287,900
x Dundas	341,525	y Fort Erie*	646,000
x Dunnville Area	2,585,688	Fort Frances*	1,800,000
Eganville	104,000	x Fort William* /Ext.	1,560,000
x Elmvale	54,856	y Fort William (S2)*	1,465,000
Englehart	4,515	x Frankford	164,136
x Espanola	548,000	x Galt	254,420
x Essex County (Union System)	3,865,249	x Galt (S2)	167,076
x Essex Town	86,402	y Galt (S3)*	1,370,000
(Standpipe)		y Gananoque*	620,000
Fauquier Twp. (Moonbeam)	93,845	x Georgetown	837,033
x Fenelon Falls	328,191	x Georgetown (S2)*	66,000
x Ferris West	68,859	x Grimsby	124,364
x Frankford	119,402	x Grimsby (S2)	29,717
x Galt	207,708	y Grimsby S.Twp. (Smithville)*	246,000
x Geraldton	57,850	Harriston*	189,945
td Gloucester Twp. (Orleans)	10,000	x Hespeler	17,429
x Goderich	997,000	x Huntsville	474,310
x Gosfield S.Twp. (W2)	102,566	Kenora	88,100
td Grand Bend	12,000	Kincardine*	451,490
x Hanover	49,500	y Kingston Twp.*	1,656,700
x Harrow	498,329	x Kitchener (Stage 1)	1,322,596
		y Kitchener (Stage 2)*	1,681,410
		x Korah Twp.	44,810
		x Korah Twp. (S2)	131,925
		x Korah Twp. (S3)	205,500

Water Works (Cont.)

	<u>Actual or Estimated Cost</u>
yx Hastings & Ext.	201,839
x Havelock	179,104
x Hespeler	16,683
x Huntsville	109,959
Kenora	99,070
x King Twp. (Oak Ridges)	289,333
x " " (Schomberg)	123,453
x Kitchener	288,513
x Leamington (W2)	23,299
td McDougall Twp.	8,000
td McGregor Area	8,000
x Maidstone	217,239
x Markham Twp. (W1)	519,419
x " " (W2)	250,000
x Markham Vill.	46,745
x Marmora & 2 Ext.	238,097
x Meaford	483,331
x Mersea (W2)	108,260
y Michipicoten (Wawa)	181,000
x Midland	47,803
x Mitchell	166,649
x Newcastle	156,043
x Orangeville	71,324
x Parkhill	161,285
td Pelham Twp.	20,000
y Petawawa Vill.	188,500
x Playfair Twp. (Ramore)	47,259
Point Edward	181,000
td Port Burwell	10,000
x Port Perry	62,731
x Preston	259,832
x Ratter & Dunnett (Warren Area)	79,273
x Richmond Hill (W1)	222,049
" " (W2)	120,000
Rockland	116,000
y Saltfleet	366,000
x Sault Ste. Marie	89,874
x " " " (W2)	116,340
y " " " (W3)	1,097,000
" " " "A"	
" " " (W4)	210,000
" " " "B"	
x Stayner	60,274
x Tara	8,439
x Thedford	174,863
y Toronto Twp. (W1)	147,000
y " " (W2)	422,500
x Trafalgar Twp. (Oakville)	221,705

Sewage Works (Cont.)

	<u>Actual or Estimated Cost</u>
y Korah Twp. (S4)*	261,000
x Leamington	95,510
x Leamington (S2)	63,292
y Lindsay	400,670
x Listowel	552,237
x Listowel (S2)	62,699
y Listowel (S3)	48,000
x London Twp.	877,793
x Markham Vill.	612,775
x Markham Vill. (S2)	262,262
x Markham Twp.	67,501
Markham Twp. (Storm)	440,470
Markham Twp. (San. S2)	347,750
Marmora*	30,460
Mattawa*	307,630
Michipicoten (Wawa)*	366,550
x Mitchell (Stage 1)	51,088
Mitchell (Stage 2)*	302,938
y Moore Twp. (Corunna)*	830,170
x Neelon & Garson*	722,000
x Nepean Twp.	1,477,573
x Nepean Twp. (S2)	162,541
x New Hamburg*	390,000
New Liskeard	234,775
yx Newmarket*	288,795
yx Newmarket/East Gwillimbury*	1,030,108
Niagara*	254,500
x North Bay area	2,372,976
x Norwich	4,000
x Orangeville	180,453
yx Owen Sound (Storm)	742,580
y Owen Sound (San.)*	1,622,830
Paris*	825,000
x Pickering Twp.*	585,500
x Playfair Twp. (Ramore)	60,251
x Point Edward	840,854
x Port Arthur	2,208,074
y Port Arthur (S2)*	673,072
x Port Colborne	697,403
x Port Colborne (S2)*	155,975
y Port Colborne (S3)*	191,000
x Port Colborne (S4)	50,000
yx Port Credit*	227,600
Port Dover*	564,800
yx Preston*	885,098
y Preston (S2)	87,629
x Richmond Hill	360,627
Saltfleet*	539,910
x Sault Ste. Marie Area	3,296,726
Seaforth	200,901
x Shelburne*	209,000

<u>Water Works (Cont.)</u>		<u>Sewage Works (Cont.)</u>	
	<u>Actual or Estimated Cost</u>		<u>Actual or Estimated Cost</u>
y Val Albert	227,075	Sidney Twp. (Batawa)*	130,000
Vankleek Hill	164,500	y Simcoe*	803,332
td Waterdown	10,000	St. Catharines*	535,800
Watford/Wyoming/ Plympton	506,084	x Stirling & Extension	267,908
y Wellington	265,221	x Stratford	927,382
y Widdifield Twp. Ext.	232,000	x Stratford (S2)	91,902
x Whitby Twp. (Brooklin)	202,200	x Streetsville	310,938
x Winchester Vill.	269,528	x Sudbury (McKim Twp.)	605,779
		x Sudbury (S2)*	1,800,000
		y Sudbury (S3)*	462,760
		Sutton*	288,000
		x Tarentorus (S2)	134,256
		Tarentorus (S3)*	187,500
		x Tavistock (Stage 1)	46,046
		Tavistock (Stage 2)*	293,050
		x Tillsonburg	609,793
		Timmins*	820,719
		x Toronto Twp.	526,687
		x Toronto Twp./Metro*	1,876,941
		x Toronto Twp. (S3)*	721,418
		x Toronto Twp. (S4)*	339,525
		x Trafalgar Twp.	257,673
		x Trenton	515,937
		y Trenton (S2)*	202,000
		Vankleek Hill*	205,000
		y Waterford*	307,000
		x Waterloo	709,144
		Waterloo "A"	22,000
		x Westminster Twp.	270,997
		x Wiarton	130,539
		y Widdifield (S2)*	232,035
		x Winchester	94,802
		Wingham	18,126

WATER WORKS TOTAL \$24,826,684

SEWAGE WORKS TOTAL \$77,951,004

GRAND TOTAL - WATER WORKS AND SEWAGE WORKS \$102,777,688

Federal financial assistance, undertaken late in 1960, continued to provide municipalities with incentive and assistance for the construction of sewage works aimed at the reduction of pollution. This continued to be administered by Central Mortgage and Housing Corporation which was authorized to lend two-thirds of the cost of that part of the sewage works project which qualified, and to cancel 25 per cent of this loan if the work was completed within

a specified period of time. When this plan was initiated in 1960 the closing date was given as March 31st, 1963. This was extended late in 1962 to March 31st, 1965. This extension would enable many municipalities to take advantage of this assistance and to undertake these necessary projects. It was available only for certain parts of sewer systems and for all sewage treatment plants. Water works were not included. This Commission co-ordinated its programs to fit in with those of the federal administration, and much of the financial assistance given was for projects undertaken and carried out by the Commission.

Division of Construction

When an agreement is made between the Commission and a municipality the responsibility for supervising the construction of that project falls under the direction of the Division of Construction. This involves supervision and control of the project until it is completed and turned over to the Division of Plant Operations. Consulting engineers are engaged to prepare the plans for the Commission, and field staff is employed to exercise supervision over the construction during its entire period. Details of the work of the division are shown in the report of the director.

The volume of work under the direction of the division was higher in 1962 than in the previous year. Forty-nine contracts were completed during the year, 27 being for sewage works and 22 for water works. The values of these were \$11,922,156.88 for sewage works and \$3,823,919.77 for water works, a total of \$15,746,076.65. Encouragement was given at all times to municipalities to proceed with such works. This was especially true in the smaller communities where financing created greater problems. The experienced staff of the Division of Construction was available to the municipalities in carrying out these programs. At the end of the year there were 77 projects under the direction of the division involved in pre-construction and actual construction stages.

Procedures of the Commission in dealing with the construction programs were under continuous review, with the objective of improving specifications, tendering practices, construction programs, and all features involved in these works. The general conditions in the specifications of the Commission were altered somewhat during the year. Bonding procedures involved performance bonds as well as labor and material bonds. Work was called by tenders which were opened in public.

The winter works subsidy program on OWRC projects for 1961/62 involved contracts valued at \$17,353,024. and the total value of the works completed during the subsidy period was \$8,414,654. The total amount of the subsidy on this work was \$1,576,669. or 18.74 per cent of the work during this time. Municipalities were encouraged to undertake work during the winter months in co-operation with the program of the federal government and the province, whereby the former paid 50 per cent of the labor cost and the latter 25 per cent. This incentive was responsible for carrying on a good deal of this work during that period of the year.

ONTARIO WATER

(CONSTITUTED BY SPECIAL ACT)

BALANCE

AS AT

ASSETS

CAPITAL ACCOUNT

CASH IN BANK	\$ 489,516.67
RECOVERABLE ADVANCES	18,388.05
ACCOUNTS RECEIVABLE	5,239,084.06
CAPITAL ASSETS	
COMPLETED PROJECTS OWNED BY ONTARIO WATER RESOURCES COMMISSION	47,821,341.90
CAPITAL ADVANCES FOR COMPLETED PROJECTS OWNED BY MUNICIPALITIES	6,105,447.38
CONSTRUCTION IN PROGRESS	8,290,377.49

\$67,964,155.55

RESERVE ACCOUNT

CASH IN BANK	\$ 31,455.06
ACCRUED INTEREST RECEIVABLE	7,594.00
INVESTMENTS, AT AMORTIZED VALUE (MARKET VALUE - \$ 720,036.25)	711,323.59
AMOUNT DUE FROM CAPITAL ACCOUNT	<u>2,727.63</u>
	\$ 753,100.28

DEBT RETIREMENT ACCOUNT

CASH IN BANK	\$ 53,967.79
ACCRUED INTEREST RECEIVABLE	28,237.47
INVESTMENTS, AT AMORTIZED VALUE (MARKET VALUE - \$1,970,385.00)	1,959,260.19
AMOUNT DUE FROM CAPITAL ACCOUNT	<u>7,807.83</u>
	\$ 2,049,273.28
	<u>\$70,766,529.11</u>

RESOURCES COMMISSION

- 11 -

OF THE ONTARIO LEGISLATURE)

SHEET

DECEMBER 31, 1962

LIABILITIES

CAPITAL ACCOUNT

ACCOUNTS PAYABLE AND CONTRACT RETENTIONS		\$ 4,416,499.04
ADVANCES FROM MUNICIPALITIES AND OTHERS		
OPERATING AND INTEREST	\$ 590,564.71	
CAPITAL	<u>3,563,164.51</u>	4,153,729.22
DUE TO PROVINCE OF ONTARIO		
TREASURY DEPARTMENT ADVANCE	\$ 25,000.00	
SUNDRY	<u>973.23</u>	25,973.23
FUNDED DEBT PAYABLE TO THE PROVINCE OF ONTARIO		
1957 ADVANCES, MATURING DECEMBER 31, 1987, 5.5%	\$ 659,670.88	
1958 ADVANCES, MATURING DECEMBER 31, 1988, 4.75%	7,502,389.38	
1959 ADVANCES, MATURING DECEMBER 31, 1989, 5.9%	11,957,869.44	
1960 ADVANCES, MATURING DECEMBER 31, 1990, 6.05%	13,979,335.39	
1961 ADVANCES, MATURING DECEMBER 31, 1991, 5.62%	11,854,332.25	
1962 ADVANCES, MATURING DECEMBER 31, 1992, 5.55%	<u>13,403,821.26</u>	59,357,418.60
AMOUNTS DUE TO RESERVE ACCOUNT		2,727.63
AMOUNTS DUE TO DEBT RETIREMENT ACCOUNT		<u>7,807.83</u>
		<u>\$67,964,155.55</u>

RESERVE ACCOUNT

FUNDS FOR RENEWALS, REPLACEMENTS AND CONTINGENCIES UNDER SECTION 43 OF THE ACT	\$ 753,100.28
	<u>\$ 753,100.28</u>

DEBT RETIREMENT ACCOUNT

SINKING FUND FOR THE RECOVERY OF THE COST OF CAPITAL ASSETS AT 3 1/4 UNDER SECTION 44 OF THE ACT	\$ 2,049,273.28
	<u>\$ 2,049,273.28</u>
	<u>\$70,766,529.11</u>

Division of Plant Operations

As the construction program of the Commission expanded the effects were felt by the Plant Operations Division, which in turn became responsible for supervision of the operation of these works. The number of projects at the end of the year under the direction of the division had risen to 155 as compared with 111 in 1961, and 65 at the end of 1960. This increase of 44 projects during the year necessitated an increase in the staff to 41 at the end of 1962 in comparison with 31 at the end of 1961. The capital cost of works in operation at the end of 1962 was \$60,711,847.00 of which \$42,011,784. was for sewerage projects and \$18,700,063.00 for water projects. The capital value of the works coming into operation in 1962 amounted to \$15,746,076.65 of which \$11,922,156.88 was for sewage projects and the balance for water.

The operation of these projects is an important service, aimed to make full use of the costs involved in construction. It was designed to ensure that the results obtained would meet all requirements, and that there would be efficiency at minimum costs. Well trained operators are an essential feature of this program. The number of plant operators at the end of the year totalled 162, operating 50 projects. This was an increase from 145 in 1961. Once again it is noted the large number of operators on sewage projects, 129 as against 33 for water. The total operating cost for all these projects during the year amounted to \$1,375,786.59 of which \$1,072,206.11 was for the sewage works. The volume of sewage treated during the year totalled 16,559,426,000 gallons. The average operating cost per million gallons of sewage was \$65.14. The volume of water treated and distributed during the year amounted to 6,339,592,000 gallons. The cost of treating and delivering this was 4.79 cents per thousand gallons. It is gratifying to note the good results obtained in the operation of these water and sewage projects. Opportunity was being given to the operating staffs to improve their knowledge, and under the direction of headquarters' staff full advantage was being taken of this. Special training courses for operators were also a part of the program of the Commission during the year. If good results were to be obtained and pollution abatement made effective the operation of these plants must be maintained at a high level.

The local advisory committees, working with the staff of the Commission in the management of the different works, had important responsibilities. These committees, usually numbering five or six persons appointed by the municipalities, meet regularly with the staff of the Commission and discuss problems of mutual interest. The Commission was in the position to pass on to the municipalities and to the operators new developments and information which had been found effective elsewhere. During the year 70 meetings were held with these local advisory committees. The frequency of the meetings depended upon the nature of the operation and any complications which may have arisen.

Official openings of new projects took place in 18 municipalities during the year. In this way the public was given an opportunity to see what had been provided for them and to become more familiar

with the operation of water and sewage projects.

Sanitary Engineering Division

Again much of the program of the Commission revolved around sanitary engineering activities. The division, charged with this responsibility, supervised all water works systems, sewerage works, stream pollution, and related matters in the field of environmental sanitation. The examination of all plans and specifications for the construction of water and sewage works occupied a considerable part of this program, and many field studies had to be made in respect to special problems. It was not possible to carry on as much survey work on stream pollution as was desired, but attempts were made to trace down all sources of pollution and to take appropriate action to deal with these. Some of the more prominent parts of the program of this division follow:

(a) Water Works

The number of municipalities and other community areas served by water works systems in operation at the end of the year was 432, and these served an estimated population of 4.5 million persons, or approximately 71.3 per cent of the total population of the province. Supervision of the operation of these works was the responsibility of the district engineering staff, consisting of 16 engineers and nine engineer's assistants at the end of the year. They carried out 1,031 inspections of water treatment plants against 815 the previous year. The number of samples collected for bacteriological tests totalled 2,673, for chemical examinations 1,508, and for other tests 79.

(b) Sewage Works

There were 396 municipalities in Ontario with populations greater than 500 and of these 186 municipalities were served by sewage treatment plants. This compares with 156 municipalities in 1961. The population served by these plants was approximately 4.0 millions or 63.5 per cent of the total population of the province. The rapid rate of construction of sewage treatment works was doing much to correct sources of pollution and to prevent new pollutants gaining entrance to the water courses.

The district engineering staff, responsible for the inspection of these sewage treatment facilities, made 1,248 inspections during the year, compared with 1,175 the previous year. Samples collected were 961 bacterial, 2,137 chemical, and 17 others. There was a substantial increase in the number of samples over previous years even though the number had to be somewhat limited by restrictions in the laboratory.

(c) Industrial Wastes

A substantial portion of the division's activities centred around the control of certain industrial wastes, particularly those of an organic nature. Some of these are discharged direct to municipal sewers and treatment plants, while others which

cannot connect to public sewers must provide their own treatment and disposal. The trend has been to connect these wastes into the public sewers wherever feasible. Canneries and milk plants created special problems during the year. There were 139 inspections of canneries, the number in operation of which decreased from 91 to 82, indicating a trend towards consolidation in this industry. The number of inspections made on milk plants during the year totalled 225. Spray irrigation continued to occupy a major role in the treatment of these wastes. The high organic content of both cannery and milk plant wastes was making it difficult to utilize conventional treatment processes. Meat processing plants also involved difficulties, and during the year 76 inspections were made of miscellaneous waste treatment facilities, all of the non-chemical type. It is satisfying that good co-operation was received from the industries.

(d) Stream Sanitation

One of the objectives in any program of sanitary engineering is to ensure that the streams will be maintained in satisfactory condition. In order to carry this out it is necessary that frequent surveys be made of these waters. During the year 147 stream surveys were made. These were in addition to 105 municipal pollution surveys. The two together required the collection of 3,341 samples for bacteriological examination and 2,780 for chemical tests. These figures may be compared with 2,109 bacterial and 2,506 chemical samples for the previous year. This work was limited by the number of staff available and the capacity of the laboratory for making the analyses. A further limitation was involved since a large part of this work had to be carried out during the summer. However, casual staff, mostly from universities proved of great assistance to the Commission in meeting these programs.

The program of providing clean streams in Ontario was progressing favorably. It was recognized that it was something which required time, and especially was this so as increases in population occurred, and new industrial plants were put into operation. The only way in which this objective could be reached was by continuous supervision and close control of all sources of pollution regardless of the type. The major program undertaken in the construction of sewage works, and similar activities in the industrial field, would mean much towards reaching the desired objective of stream sanitation.

A feature of the work of the Division of Sanitary Engineering was the number of special investigations required. During 1962 there were 792 of these programs. They included a large variety of problems and it was estimated that these investigations utilized approximately 30 per cent of the time of the field staff.

(e) Activities in the Districts

The field work of the Division of Sanitary Engineering was con-

tinued by the same general organization involving four districts, each under a district engineer and complementary staff. In the entire division there were 24 engineers and 11 engineering assistants, while the field staff was composed at the end of the year of 16 engineers and nine engineering assistants. It was expected this number would be increased in 1963. During 1962 there were 1,047 meetings of which 47 were with municipal councils, 28 with public utilities commissions, 276 with municipal clerks, 150 with other municipal officials, 341 with consulting engineers, and 205 with health officials. Through these meetings it was possible to co-operate locally and to deal with problems of mutual interest.

(f) Sub-Division Plans

The review of all sub-division plans, submitted by the Community Planning Branch of the Department of Municipal Affairs, continued. During this year 527 plans of sub-divisions were submitted for examination, as compared with 603 for the previous year. In addition, examinations were made of 42 area plans, and the results of all of these were passed on to the Community Planning Branch.

(g) Courses of Instruction

An important phase of the work of the division was the training of water and sewage works operators. The facilities of the laboratory building were available for this, and a general program provided operators with three one-week courses of training. During the year two of these schools were held for water works operators and two for sewage works operators. This program was well organized and was expected to continue on a regular basis. When an operator completed his course of training and passed the examinations, he was given a certificate of qualification. The first 79 certificates for water works operators were issued during the year. Similar certificates were to be issued to operators of pollution control works.

The Division of Laboratories

Adequate laboratory facilities are essential for all parts of the Commission's program. The OWRC laboratories continued to provide examination of samples submitted by field staffs and thus played an important role in the supervision of water, sewage, and industrial waste processes. The work involved in this part of the program expanded greatly in keeping with the growth of other activities of the Commission.

The activities of the Division of Laboratories continued as in the previous year, under the branches of bacteriology, chemistry, biology, industrial waste, and purification processes.

A general indication of the expanded program of the division was seen in the number of samples and tests carried out during the year. The total number of samples submitted was 45,985, compared with 40,126 in 1961, and 29,296 in 1960. These figures have risen at a rapid rate

since 1956 when the total was 5,915. Similarly, the number of analyses performed on these samples totalled 149,038 in 1962 as compared with 130,151 in 1961, or an increase of 14.5 per cent.

The Bacteriological Branch of the division examined a total of 19,280 samples during the year, as compared with 15,859 during the previous year. These involved 28,216 determinations, as compared with 21,091 in 1961, an increase of 33.7 per cent. Special work was carried on by the branch in order to solve special problems arising in the field.

In the Chemistry Branch a further major increase in samples and determinations occurred during the year. The samples received totalled 26,109, as compared with 23,860 in the previous year, while the determinations reached 119,845, as compared with 108,449 in 1961, showing an increase of 10.5 per cent in these determinations. The high proportion of chemical tests in comparison with others was evident in these figures.

The Biology Branch also increased markedly the number of samples received and the determinations made. During the year 596 samples were received in the laboratory, as compared with 407 the previous year, while the number of tests on these totalled 991, in comparison with 611 for the previous year, an increase of 62.2 per cent in the number of tests. A new responsibility of the Biology Branch was the control through issuance of permits of the application of aquatic herbicides and algicides during the year. In this there was close co-operation with representatives of the Department of Lands and Forests. This was an endeavour to make certain that water supplies would not be injuriously affected by the application of these products. The branch also continued its studies on the control of nuisances created by the algae *Cladophora*. Chemical treatment of this was tried out in selected areas in an effort to find some means which might give relief from these serious nuisances to people living at the water's edge. The role of biology in the supervision of water resources was becoming ever more important as new wastes and new methods of treatment of aquatic growths came into being.

Again, special emphasis was placed on the control of industrial wastes, and the work of this branch expanded during the year in order to ensure the prevention of stream pollution and injurious effects on the operation of sewage treatment works. The effects of these wastes were felt more and more as the province expanded industrially. When sewage treatment works were to be constructed it was important that full information be made available beforehand on the nature of the industrial wastes and their possible effects on these processes. During the year 276 field investigations were made, ranging from surveys of combined discharges to municipal sewer systems, to investigations of individual sources of waste from industries at various places in the province. A variety of industries discharge wastes which are difficult to treat and which are of a complex nature. This work would require intensive field studies and laboratory examinations and research. It was essential that the various new wastes encountered be given proper treatment, and that existing wastes yielded to measures which would protect

the streams. However, there were a number of industrial wastes for which effective and economical methods of treatment had not been found.

The Purification Processes Branch was organized to carry on research and special investigations in water and waste water programs. The complexity of many of these problems made it essential that studies be carried out in the laboratory as well as in the field. During the year this work involved a number of problems, from routine taste and odor tests, to the effects of pollutants of various kinds. Research studies were made on diatomite filters, ion exchange, mechanical aerators, and others. Where special problems arise in the field the Purification Processes Branch endeavoured to find a solution.

Water Resources Division

The work of the Division of Water Resources was carried on under two main branches, one dealing with ground water and the other surface water. Both branches carried out extensive investigations in many parts of the province and continued with an inventory of basic hydrological data. Some pertinent information on the activities of each branch is noted herewith:

(a) Ground Water Branch

As in the previous year interest in ground-water resources continued at a high level. This resource was of great significance to the province, and since it was a renewable resource it could be used to advantage for domestic water supplies, industrial use, agriculture and related programs. Numerous requests were received for assistance in locating ground waters and in their development. The program of ground-water surveys involved 28 special investigations of a variety of problems, 31 hydrogeologic surveys undertaken for municipalities, and supervision of 11 test-drilling and well-construction projects. A number of these investigations involved possible pollution of the ground water, and it became more apparent that prevention of pollution from gaining contact with ground water was becoming an important task. The use of ground water by small, as well as inland communities offered opportunities of providing public utilities at a reasonable cost.

The interest in ground water supplies was indicated in some measure by the fact that 10,638 records for wells drilled were forwarded to the branch by drilling and boring contractors. This figure compared with 8,095 in 1961 and 7,457 during 1960. Inspections by representatives of the Commission were made on 9,315 locations of wells. The licencing program for the business of boring and drilling wells was continued and 406 licences were issued during the year. The observation well program continued to be of service in studying ground water conditions. At the end of the year water levels in 30 observation wells were being measured, with automatic recorders being used in 13 of these wells. This information was useful in the development of a record of the water resources of the

province, and particularly to indicate changes in water levels, especially in those areas where extensive use was being made of this resource.

(b) Surface Water Branch

Much of the activity of the Surface Water Branch centred about the new program of investigating and issuing permits for the use of water supplies. This involved the nature and extent of surface waters available within a drainage basin and its fair allocation to water users. Because of this new activity it was not possible to carry on water resources surveys on a county basis or on a drainage basin as had been undertaken previously. It was expected these surveys would go forward at a later date.

(c) The Water Permit Program

Both branches of the division combined to deal with the program involving permits to be issued for anyone using water in excess of 10,000 gallons per day. The use of water for irrigation was increasing rapidly, and in certain parts of the province the supply was not sufficient for all would-be users. Division of the available water, under these circumstances and without undue interference with the stream, was assuming greater significance. The number of applications received for permits to take water from surface and ground waters totalled 1,170. Final decisions, in respect to the use of the available water, could not be determined until hydrometric studies were completed. It would be necessary to continue this field study for some time in order to fairly apportion available water supplies among the users.

Information for the Public

Most activities of the Commission concern the public either in urban centres or elsewhere. The OWRC program also requires the co-operation of the public, particularly in respect to pollution abatement and in the protection of the water resources of the province. Efforts were made to supply information which would be helpful in enabling all to co-operate in these projects. This information was made available through an OWRC news release service, distribution of special literature, and exhibits. News releases reached newspapers, trade and other publications, TV and radio stations.

An exhibit at the Canadian National Exhibition enabled the Commission to acquaint large numbers of visitors with some of the work being carried on. The Industrial Waste Conference, the ninth to date, had as its objective the dissemination of information on the disposal of industrial wastes. Use was made also of the laboratory facilities for conferences and the training of personnel.

The busiest year in the short history of the Commission was reflected in increased activity by the Information Branch, in all spheres of publicity, public relations and dissemination of information.

Legislative Changes

The report of the senior solicitor of the Commission outlines the changes that were made during the year in legislation. These covered a number of subjects and as in previous years amendments were made to The Ontario Water Resources Commission Act, enacted in 1957. Court actions were taken against certain offenders responsible for violations of the legislation or the regulations.

The Property Acquisition Program

The Real Estate Branch of the Commission was involved in an extensive program to acquire property or easements needed for the construction program which increased so greatly during the year. The policy of the Commission was to obtain property by purchase wherever possible, and to use expropriation only where it became unavoidable. During the year 481 properties were optioned or acquired, while 310 properties were under negotiation at the end of the year. In spite of the increase in the acquisition of properties during the year the percentage which had to be expropriated rose only from 8.7 per cent in 1961 to 9.6 per cent during this year. There were 42 expropriations outstanding at the end of the year.

Accounting Activities

Once more, the branch of the Commission responsible for accounting continued its growth, in keeping with the expansion of activities in general. This branch was responsible for the supervision of all financial activities of the Commission, both in capital and operating. Gross capital expenditure for the 1962-63 fiscal year was estimated at \$22,000,000. compared with \$14,507,000 in 1961/62.

Staff of the Commission

Thanks are extended to the fine work of members of staff during the year. Their activities increased substantially, and many new problems were encountered. The co-operation of all in a combined effort to deal expeditiously with these matters was most gratifying. The staff included a wide range of trained personnel, in many disciplines, technical and otherwise. The great variation in the activities dealt with by the Commission made it imperative that the staff be thoroughly trained in each one's respective field. Many continued training and specialization through courses given at night in different centres.

At the end of the year the total number of staff at headquarters was 300, with 162 operators in the field responsible for the operation of OWRC projects. The 1961 year-end total was 411.

The branches and heads of branches at the end of the year was as follows:

The organization at the year-end consisted of the following:

Administration

General Manager and Chief Engineer - Dr. A.E. Berry
Assistant General Manager - G. M. Galimbert
Assistant General Manager - D. S. Caverly
Commission Secretary - W. S. MacDonnell
Executive Engineer - L. E. Owers
Solicitor - Henry Landis
Information Officer - John C. Scott
Chief Accountant - D. A. Joynt
Personnel Officer - A. R. W. Uren
Project Officer - F. J. Campbell
Chief Property Agent - H. H. Mitchell
Contract Payments - T. Beall

Division of Construction

Director - Allan W. Shattuck
Asst. Director - J. C. F. Macdonald

Division of Laboratories

Director - F. A. Voegel
Asst. Director - A. J. Harris
Supervisor, Chemical Laboratory - C. E. Simpson
Co-Supervisors, Industrial Waste - A. J. Harris and R. H. Millett
Supervisor, Purification Processes - J. G. Duncan
Bacteriologist - L. T. Vlassoff
Biologist - J. H. Neil
Superintendent Mech. Services - Y. T. Lambert

Division of Plant Operations

Director - D. S. Caverly
Asst. Director - B. C. Palmer
Supervisor, Sewage Works - B. C. Palmer
Supervisor, Water Works - C. W. Perry

Division of Sanitary Engineering

Director - G. M. Galimbert
Asst. Director - K. H. Sharpe
Supervisor, Field Activities - G. R. Trewin
Supervisor, Stream Sanitation - G. H. Kay
Supervisor, Sewage Works - J. R. Barr
Supervisor, Water Works - K. H. Sharpe

District Engineers

District No. 1 - H. Browne
District No. 2 - W. A. Steggles
District No. 3 - C. H. Kretch
District No. 4 - L. South


Division of Water Resources

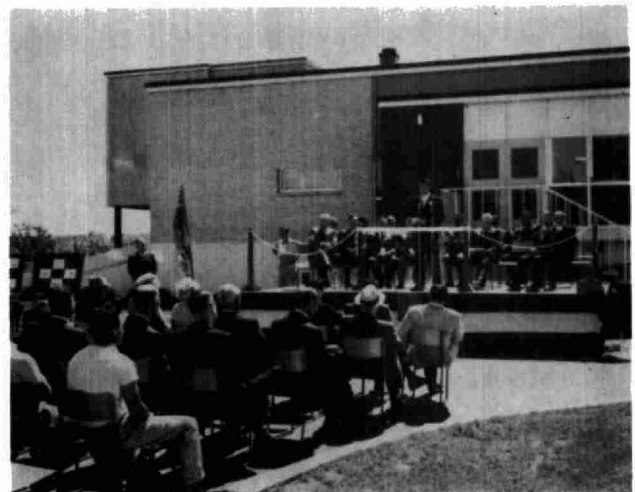
Director - A. K. Watt

Asst. Director - K. E. Symons

Supervisor, Ground Water - D. Jeffs

Supervisor, Surface Water - K. E. Symons


A. E. Berry,
General Manager and
Chief Engineer.



ADMINISTRATIVE BRANCHES

Activities of the Administrative branches of the Commission are recorded herewith:

Accounts Branch -- D. A. Joynt, Chief Accountant.

Records of the Accounts branch indicated continued growth in the activities of the Commission which is revealed in the following statistics:

(a) Expenditures in the Operation of Water and Sewage Treatment Plants

1960	\$ 586,453
1961	1,107,939
1962	1,375,787

(b) Gross Capital Expenditures

1960/61	\$14,786,000
1961/62	14,507,000
1962/63	22,000,000 (Est.)

(c) Ordinary Vote Expenditures

1960/61	\$1,505,175
1961/62	2,048,721
1962/63	2,431,000 (Est.)

(d) Gross Capital Revenue

	<u>Winter Works Subsidies</u>	<u>Payments from Municipalities CMHC and Others</u>	<u>Total</u>
1960/61	\$ 329,445	\$ 787,616	\$1,117,061
1961/62	624,129	3,284,173	3,908,302
1962/63	1,100,000 (Est.)	8,000,000 (Est.)	9,100,000 (Est.)

(e) Revenue from Billings to Municipalities

	<u>Debt Retirement</u>	<u>Reserve for Contingencies</u>	<u>Interest</u>	<u>Operating Expenses</u>	<u>Total</u>
1960	\$267,706	\$112,944	\$1,024,204	\$ 643,561	\$2,048,415
1961	656,312	220,244	1,833,270	1,198,251	3,908,077
1962	960,797	345,137	2,439,253	1,639,612	5,384,799

Growth was particularly evident in the matter of gross capital expenditures, with full impact being felt in the latter part of 1962 as the March 31, 1963, deadline for Central Mortgage and Housing Corporation financing of sewage projects, drew nearer. This deadline later was extended two years, but the Commission continued to feel the impact of the earlier rush as 1962 ended.

In the Accounts Branch itself, effort was directed to the improvement of accounting systems and records. Budgetary control was established over Commission head office expenditures at the time commitments were made.

In the field, members of the branch staff continued to provide assistance to municipalities in establishing and maintaining accounting systems. This service was extended during 1962 to include the Township of Cumberland, and the villages of Petawawa, Cookstown, Hastings, Marmora and Newcastle.

Information Branch -- John C. Scott, Information Officer.

Increased activity of the Information Branch during 1962 was a natural result of the busiest year in the short history of the Commission. More tender calls, more contract awards, more official openings of OWRC works, more interest in Commission activities, particularly in the field of pollution and its abatement by press and public alike, all tended to increase the responsibilities and activities of the branch.

Media for informing those interested in the OWRC and its work were news releases, literature distribution, exhibits, advertising, and on-the-spot handling of numerous enquiries by correspondence, callers at the office or by telephone.

Feature news releases during the year were concerned with publication of the First OWRC Ground Water Bulletin, legislation providing for control of chemicals used to eliminate aquatic nuisances; legislation which amended plumbing inspection regulations; a report of a survey of the Lake Ontario waterfront between

Burlington and Scarborough Township; a report of meetings between OWRC officials and representatives of the detergent industry and an OWRC assessment of the detergent problem. Other releases concerned millions of dollars worth of contract awards during the year, appointment of consulting engineers to various Commission projects, 18 official openings of OWRC works; and various meetings and conferences.

In addition to the regular news releases numerous special items were written or material was supplied various media to help in the preparation of special articles. Pictures, taken by the branch photographer, were supplied with many of these items. Publications for which special articles were written or to which pertinent material was supplied, included Public Works in Canada, Daily Commercial News, Monetary Times, Civic Administration, Canadian Municipal Utilities Magazine, Public Works (U.S.A.), Rockwell News (U.S.A.), Ontario Government Services, and various daily and weekly newspapers.

Local newspapers in some municipalities where official openings of OWRC projects were held, published special supplements in honor of the occasions. In all instances, the Information Branch prepared and supplied special material and prepared a congratulatory advertisement.

Special OWRC conferences attended and publicized included the Ninth Industrial Waste Conference; Water Well Drillers' Conference; conference on aquatic nuisance control permits; Conference on Environmental Sanitation; and the conference with representatives of detergent manufacturers. The Industrial Waste Conference at Honey Harbour was especially well publicized. A representative of the Information Branch supplied The Canadian Press in Toronto with twice-a-day telephoned reports.

Increased interest of the public in Commission work was evident from the number of requests for literature. Such requests came via mail, telephone or by personal call at the office. All were attended to immediately or as quickly as possible. In addition, thousands of pieces of literature were given out at the OWRC exhibit at the Canadian National Exhibition. Late in the year, Commission decision to make a change for certain items published by OWRC necessitated the setting up of new procedures in regard to distribution of these specific publications.

Paid advertising handled by the branch included the annual ads placed in six trade publications. Other ads were placed in special issues of the Monetary Times, Daily Commercial News and

Civic Administration. Also, there were good will ads, congratulatory in tone, placed in special issues published by local newspapers on the occasions of official openings of OWRC water or sewage projects. Tender call ads placed in 1962 totalled 79.

The OWRC exhibit at the Canadian National Exhibition was an outstanding success and attracted much favorable comment, both for its educational value and artistic appearance. It featured laboratory and biology displays along with technamated versions of the workings of water treatment and sewage treatment works. An attractive waterfall backdrop was another feature.

The Technamation units were used as unit exhibits later at the Canadian Chemical and Equipment Exhibition and the Water Pollution Control Federation annual meeting, both in Toronto.

Assistance in the way of loan of color prints, depicting various kinds of pollution, was given the Federation of Anglers and Hunters in that organization's exhibit at the National Sportsmen's Show, also in Toronto.

The Information Branch continued to take its own pictures, prints of which were given wide circulation.

Other activities included:

Coverage of OWRC-sponsored courses for operators of water and sewage works in Ontario, the most noteworthy one in 1962 being the first senior course for water works operators, which received excellent publicity;

Supervision of preparation, prior to printing, of a number of publications, chiefly reports;

Improvement of the system whereby members of the Ontario legislature were kept informed of OWRC activities in their own constituencies;

Reception of numerous visitors, both domestic and foreign, seeking information about the Commission and its work;

Handling of necessary TV and radio contacts and arrangements;

Handling of final editing and production of monthly and annual reports;

Obtaining, for Commission use, the National Film Board film "River With A Problem", and arranging for its circulation;

Preparation of special memo on public relations for the Commission;

Assistance rendered officials of the Water Pollution Control Federation and the Canadian Institute on Pollution Control in publicizing the 35th annual meeting of the former organization which was held in Toronto;

Attendance at all tender openings for OWRC works projects.

Legal Branch -- H. S. Landis, Senior Solicitor.

Extensive and important amendments to The Ontario Water Resources Commission Act were made in 1962. The substance of these amendments follows:

1. The addition of any substance to the water of any well, lake, river, pond, spring, stream, reservoir or other watercourse or water for the purpose of killing or affecting plants, fish or other living matter without a permit issued by the Commission was prohibited. The Commission was authorized, in its discretion, to issue, refuse to issue, or to cancel a permit or to impose such terms and conditions in issuing the permit as it deems proper or to alter the terms and conditions of a permit after it is issued. The contravention of this requirement or of any of the terms and conditions of a permit was made an offence, for which a fine was imposed. Authorization was given for exemptions from the requirement of a permit by regulations.

The addition of chemicals to water to control aquatic nuisances presents a potential hazard to health and wildlife and the amendment furnishes a flexible means of control to reduce this hazard to a minimum.

2. The requirement of Commission approval for the establishment or extension of or a change in water works or sewage works was extended to all sewage and water works, both public and private, except those water works which do not present a public health hazard or which are of a minor nature or which are privately-owned and serve five or fewer private residences,

and except those sewage works which do not create a risk of pollution of watercourses, or which are privately-owned sewage works serving five or fewer private residences, or which chiefly drain agricultural lands or which are drainage works under certain Provincial Statutes.

3. The contravention of the requirement in The OWRC Act of a permit issued by the Commission for the taking of water under certain circumstances, or the contravention of any of the terms and conditions of such a permit was made an offence for which a daily fine could be imposed.

The requirement of a permit issued by the Commission was made applicable to the taking of water by portable means at any time.

4. The Commission was authorized to deposit monies in the Province of Ontario Savings Office as well as in Chartered Banks.

5. It was made clear that a County was authorized to carry out plumbing inspection in the municipalities forming part of the County for municipal purposes, that a local municipality could carry out inspections, and that local boards of health of local municipalities or of health units were authorized, by agreement, to carry out plumbing inspections in a local municipality or in a county.

Local municipalities, counties and local boards of health carrying out plumbing inspections were authorized, by by-law, to prohibit the use of plumbing after it has been constructed or altered until it has been inspected. Where local boards of health or counties would carry out plumbing inspection they were authorized to pass the same types of by-laws relating to plumbing inspection, and fees and requiring the production of plans of the plumbing and the issuing of a permit as were local municipalities.

A penalty was provided for the contravention of a by-law providing for the inspection of plumbing, charging fees for such inspections and requiring the production of plans of plumbing to be constructed or altered and the issuing of a permit to construct or alter plumbing.

It was made clear that plumbing inspectors may enter premises to carry out their inspection duties and it was made an offence to obstruct such entry.

Where a conviction was recorded for constructing or altering plumbing contrary to the Plumbing Code, the municipality or local board of health carrying out plumbing inspection was authorized to require the owner of the premises to make the plumbing conform to the Code and, at the expense of the owner, to make the plumbing conform if he failed to do so.

6. The extension of municipal sewage works into territory without municipal organization was authorized.

7. Where a public hearing by the Commission was necessary, the Commission was authorized to hold it by one member instead of by two.

8. Four sections of The OWRC Act were amended for clarification.

During the year there were three successful prosecutions for drilling water wells without licences and for a breach of the water well regulations as well as a successful prosecution for pollution of a stream by a creamery in the Village of Clifford. A court action which had been commenced against the Commission by a consulting engineer employed in connection with the Coniston project and a longstanding claim against the Commission in connection with the Port Arthur project were settled satisfactorily. The Commission was successful in the court action in connection with the expropriation of property for the Fergus project, both at the hearing before the Ontario Municipal Board and before the Ontario Court of Appeal.

A grievance procedure for the head office staff of the Commission was prepared and the necessary work for the participation of the Commission's operating staff in the Ontario Municipal Employees Retirement System was carried out.

The form used by the Sanitary Engineering Division for the approval of water works was revised and further work was carried out in connection with the bond and other forms used by the Construction Division. A complete set of forms and procedures for obtaining a permit for the application of substances to water for aquatic nuisance control was drawn up with the assistance of the Commission biologists and the Department of Lands and Forests.

A claim in excess of \$25,000.00 against a bond company in connection with the bankruptcy of the contractor for the Georgetown and Brampton projects was settled satisfactorily. A procedure was established by the Commission for the protection of creditors with respect to the West Ferris project and when it was carried out by the contractor, the Commission released over \$80,000.00 to him.

Complicated and lengthy negotiations with a bond company and the City of Sudbury in connection with the bankruptcy of a contractor for the McKim Township project were carried out and a series of agreements entered into between the Commission and the bond company to correct the defective work. Pursuant to these agreements the Commission received, on account, more than \$95,000.00 for the repairs.

Very extensive research was carried out for the court action against the bond company for the Listowel project due to legal issues of the utmost complexity.

Papers were presented to the Water Well Drillers' Conference, the Aquatic Nuisance Control Conference and in the Water Works Operators Course. A paper on the legal control of water quality was published in Chitty's Law Journal and in Canadian Municipal Utilities and a paper on the legal aspects of a municipal public utilities commission in relation to a water works was published in the Canadian Bar Journal and The Municipal World.

The senior solicitor was appointed to the Provincial Government's Uniform Bond Procedure Committee and presented several papers to it.

Real Estate Branch -- H. H. Mitchell, Chief Property Agent.

The year was an extremely busy one for the Real Estate Branch, in common with other sections of the Commission. The volume of property acquisitions increased sharply reaching a peak in November when most municipalities felt projects must be pushed through or the federal subsidy would be forfeited. Besides the increase in projects, however, it was noticed in 1962 there was a change in the type of project being undertaken.

In previous years, where OWRC was dealing with large municipalities, property requirements comprised mainly the acquisition of treatment plant sites and trunk sewer easements

over short parcels of land where it was necessary to leave municipality streets. As the Commission dealt with smaller municipalities, however, the duties of the branch increased considerably. Three projects were recorded in 1962 where the property requirements were in excess of 80. In spite of the increased volume and the pressure to commence work quicker, however, the proportion of expropriations increased very slightly over the year. A great deal of credit must be given to the field staff for this, as to acquire property without expropriation under some of the conditions encountered during the latter part of the year, called for the exercise of exceptional patience and skill.

A classification program involved the recording of all properties owned by the Commission in a new control register by projects, with a corresponding record of all project details.

The policy of taxation came under review during the year, and was the result of several discussions with the Division of Plant Operations. Technically, all water or sewage plants should be assessed and taxes charged on them. However, in many cases where the plant was located entirely within the municipality it served, this was not done as it was regarded as a wasted effort by the municipality in assessing, collecting taxes and in turn reimbursing the Commission for the amount charged. This practice was followed in some municipalities however, and where the plant was located outside the municipality, taxes were invariably collected. All assessments had to be checked before payment could be approved and a procedure was established whereby all assessments were referred initially to the chief assessor in the municipality which ultimately would be responsible for the payments, and his approval or other comment obtained. Where he wished to query the assessment, a representative of the branch would formally inspect the property and make recommendations. Where the assessment was approved, however, it was assumed the assessment was correct. This practice had the advantage of ensuring a correct professional check of the assessment without involving the Commission in any additional staff. Since going into effect late in 1962, it worked extremely well.

In spite of the great increase in properties acquired, the "backlog" of properties still under negotiation also increased during the year. It was felt, however, that the

conditions causing municipalities to rush their projects, especially towards the end of the year, were responsible for this to a considerable extent, and in examining this "backlog" it was assumed that some of these projects were ones which normally would not have matured until 1963. It was anticipated, therefore, that there would be a slackening of demand in 1963, and time would be available to deal with outstanding work. A review of the work of the branch in this respect during the year follows:

Properties Under Negotiation

Properties under negotiation as of December 31, 1961	165
New properties listed for acquisition during 1962	626
Properties optioned or otherwise acquired during 1962	481
Properties under negotiation as of December 31, 1962	310

One of the most serious problems experienced by the branch was obtaining the final documents and closing out conveyancing procedures in property acquisitions. All property work was done through local solicitors who varied in the speed in which they completed their assignments. As a result a constant check had to be made of all projects periodically to make sure these matters were kept moving. This involved much correspondence and cross-checking. A breakdown of the year-end status of these transactions follows:

Options

Options held as of December 31, 1961	204
New Options acquired during 1962	435
Conveyance completed and final documents received from solicitors	133
Final documents outstanding as of December 31, 1962	506

The number of expropriations increased in 1962, reflecting the increase in the total properties purchased. The percentage increase was small, being 9.6%, as against 8.7% for 1961. The Commission's policy towards expropriations remained unchanged, continuing to be that expropriation was used only as a last resort and after all normal methods had failed. Its use as an expediency where time was not available for normal negotiation was not a practice permitted by the Commission

as a normal procedure, and even in the peak period during late October and November when under considerable pressure its use in this manner was kept to a minimum.

In general the time for property negotiation, normally barely sufficient, was reduced sharply during 1962. The breakdown of expropriation statistics follows:

Expropriations

Approved for expropriation	84
Expropriations registered	46
Expropriations settled	4
Expropriations outstanding	42

It will be seen, therefore, that approximately 50% of the expropriations were actually registered and of these 46, four had been settled. An examination of the 42 outstanding expropriations reveals that approximately one year is required as a minimum time for the negotiation of a settlement in an expropriation. Of the 42 properties expropriated during 1962, almost three-quarters of them were registered in the last four months of the year and all were various stages of progress.

The Commission makes a practice of maintaining its valuations throughout negotiations. It is not conceded that because of expropriation the owner is automatically entitled to more money than otherwise would have been the case, and the OWRC record of settlements to the end of 1962 had been exceptional in that in all cases where expropriations were settled, they were settled with very little change from the figure originally set. This is sound practice, and although the results may be more difficult to obtain, are much more realistic than any other approach.

Two expropriations were pending in 1962, these being the sewage treatment plant site in Belleville and the sewage treatment plant in Paris. Three appointments before the Ontario Municipal Board had been obtained by the end of 1962 for the Belleville expropriation but adjournments had been requested and granted in each case. A mutually agreeable date was still under discussion for the Paris hearing. It appeared likely, as at the end of the year, that two more expropriations would definitely be referred to arbitration and two probably referred. The former were the Kingston Township sewage treatment plant site and the Bracebridge lagoon site. The lagoon site in Smithville and a pumping station site

in Kingston were the two expropriations which probably would be taken before the Board.

In general, 1962 proved to be an extremely busy year, but a most successful one from the Real Estate Branch's point of view. Approximately twice the work was achieved by the same staff, more efficient procedures were instituted, and an accurate and accessible record instituted of all properties.

Members of the branch field staff deserved credit for the image of the Commission which they projected in their daily work during the year under review.

DIVISION of CONSTRUCTION

A. W. Shattuck, Director
J. C. F. Macdonald, Assistant Director

There was an appreciable increase in the value of contracts entered into in 1962, particularly in the case of sewerage projects. This was probably because municipalities were endeavoring to obtain maximum benefit from Central Mortgage and Housing Corporation financing which until late in the fall was expected to end in March, 1963.

In 1962 the Commission entered into contracts valued at \$25,074,688.94 of which \$4,203,178.51 was for water, and \$20,871,510.43 for sewerage.

During the year projects having a value of \$15,746,076.65 were completed, water projects valued at \$3,823,919.77, and sewerage projects valued at \$11,922,156.88.

Following is a brief summary of each Commission project on which work was done during the year:

Acton (61-W-74)



Description of Project:

Increased storage and extended distribution facilities.

Consulting Engineers:

R. V. Anderson & Assoc.
Ltd., Toronto.

Expected Completion Date:

Spring, 1963.

Estimated Cost:

Contract A: \$57,500.00
Contract B: \$91,100.00
Equipment : \$ 5,400.00

Contract A was for 8,000 ft. of 12" C.I. watermain.

Contract B comprised two 500,000-gallon underground reservoirs and a valve house with a water level transmitter. Two pressure reducing valves were installed on the existing distribution system.

Alexandria (62-S-132)

Description of Project:	Trunk sewer, pumping station, forcemain and lagoon.
Consulting Engineers:	J. L. Richards & Assoc. Ltd., Ottawa.
Expected Completion Date:	July 8, 1963.
Estimated Cost:	\$157,175.26

The contract for this project was awarded late in December and the contractor moved some of his equipment to the site for a start in the new year.

Almonte (62-S-130)

Description of Project:	Interceptor sewer, two pumping stations, force-mains, lagoon and outfall sewer.
Consulting Engineers:	J. L. Richards & Assoc. Ltd., Ottawa.
Expected Completion Date:	August, 1963.
Estimated Cost:	\$192,810.96

The contract for this project was awarded in November. Both forcemains were completed and a start was made on the outfall sewer before the year-end. Work on the lagoon was stopped on December 18th due to frost in the ground.

Arthur (62-S-114)

Description of Project:	Sewers, pumping station and lagoon.
Consulting Engineers:	Philips & Roberts Ltd., Burlington.

Expected Completion Date: February 28, 1963.

Estimated Cost: \$157,278.40

Armstrong Bros. Ltd. had completed approximately 80% of the contract by the year-end. Final grading, sodding, etc. was to be completed in the spring of 1963.

Aylmer (61-S-94)

Description of Project: Extension of sewers and four-cell lagoon.

Consulting Engineers: W. M. Veitch Assoc., London.

Completed: October, 1962.

Estimated Cost: \$458,448.00

Beaverton (61-W-83-2)

Description of Project: Extended water treatment and distribution.

Consulting Engineer: T. R. Cooil, Toronto.

Expected Completion Date: Spring, 1963.

Estimated Cost: Contract 1: \$49,600.00
Contract 2: \$10,300.00
Equipment : \$12,800.00

The first contract was awarded for an extension to the existing building and the installation of two pressure filters, a pump and a chlorinator and 3,060 ft. of 8" feedermain.

The second contract was for 2,000 ft. of 6" main complete with fittings and with house service connections.

Belleville (61-S-84)

Description of Project: Sewage treatment plant, sewer mains and pumping stations.

Consulting Engineers: Gore & Storrie Ltd.,
Toronto.

Completed: November 20, 1962.

Estimated Cost: \$2,210,150.12

Bertie Township (62-W-98)

Description of Project: Extension of 12" dia.
watermain from the
intersection of Spears
Road and Garrison Road
to the Ontario Jockey
Club.

Consulting Engineer: Canadian-British
Engineering Consultants,
Toronto.

Completed: November, 1962.

Estimated Cost: \$61,600.00

Bradford (61-W-87)

Description of Project: Contract 'A' - 12" dia.
watermain.
Contract 'B' - deep well
pumphouse.

Consulting Engineers: Proctor & Redfern, Toronto.

Completed: September, 1962.

Estimated Cost: \$142,000.00

Work commenced towards the end of May. Rapid progress was made on laying the 12" dia. watermain and the installation was completed by mid-July. Completion of the deep well pumphouse was set back owing to delay in the delivery of the pump from California. The new well was put into operation in August.

Town of Brampton (61-W-77-2)

Description of Project:

Various additions to the water supply system:

Contract B: 833,000 Imp. Gal. elevated storage tank.

Contract C: Tank foundations and valve house.

Contract D: Three well pumping buildings and controls.

Equipment : Well pumps.

Consulting Engineer:

W. O. Chisholm, Agincourt.

Completed:

Contract B: July, 1962.

Contract C: December, 1962.

Contract D: September, 1962.

Estimated Cost:

Contract B: \$151,800.00

Contract C: \$ 31,000.00

Contract D: \$ 38,600.00

The construction of the elevated steel tank was carried out through the winter and spring. The superstructure of the valve house was built when the tank was completed.

The contract for the buildings at wells 5, 6 and 7 was completed during the spring and summer.

Brampton/Chinguacousy (58-S-14-2)

Description of Project:

One M.G.D. extension to sewage treatment plant.

Consulting Engineers:

Proctor & Redfern, Toronto.

Expected Completion Date:

July, 1963.

Estimated Cost:

\$345,000.00

The contract was awarded for the extension to the plant comprising a building for the existing influent works, primary and secondary clarifiers and aeration tanks of similar size to the existing ones and a secondary digester. Increased pumping and blower facilities were to be added. Construction was on schedule at the end of the year with about \$200,000.00 worth of work completed.

Brantford Township (61-W-76)
Tutela Heights

Description of Project:	High and low lift pumping station, water storage reservoir, watermains.
Consulting Engineers:	Gore & Storrie Ltd., Toronto.
Completed:	April 1, 1962.
Estimated Cost:	\$245,000.00

One additional service pump was ordered for reduction of water pressure in mains.

Brantford Township (62-W-99)
St. George Area

Description of Project:	Watermains and elevated storage tank of a capacity of 200,000 Imp. Gals.
Consulting Engineers:	Gore & Storrie Ltd., Toronto.
Completed :	Watermains only - December 11, 1962.
Expected Completion Date:	Tank only - June 15, 1963.
Estimated Cost:	\$124,500.00

Construction of the watermains, storage tank foundations and valve chamber was completed, except for minor items. The elevated water storage tank at the year-end was being constructed in the workshops for erection in the spring of 1963.

Brooklin (Whitby Township) (59-W-53)

Description of Project:	Deep well pump, iron removal filter in new building, watermains.
Consulting Engineer:	W. T. Dempsey, Oshawa.
Completed:	June 1, 1962.
Estimated Cost:	\$170,000.00

The mains were taken into service in January, 1962, but the iron removal filter started operation only on June 1, 1962, because of late delivery.

Burlington (62-S-105)

Description of Project:	Sewage treatment plant.
Consulting Engineers:	James F. MacLaren Ltd., Toronto.
Expected Completion Date:	May, 1963.
Estimated Cost:	\$2,100,000.00

This plant includes a pumping station, grit building, blower building, aeration tanks, final settling tanks and sludge holding tank. Initial capacity--3.0 m.g.d. The aeration tanks are sized to treat 12 m.g.d. and in the early stages sewage was to be treated by the total oxidation process. By the end of the year 80% of major structural operation was completed.

Chesley (62-S-109)

Description of Project:	Sanitary sewerage system including three pumping stations, forcemains, sewers and stabilization ponds.
Consulting Engineers:	Hisey & Barrington, Richmond Hill.
Expected Completion Date:	June, 1963.

Estimated Cost: \$268,280.00

By the end of the year 85% of the work on the sewers, pumping stations and forcemains was completed. Wet ground conditions at the lagoon site prevented more than 30% of the work being done in this area.

Cookstown (58-W-28)

Description of Project:	Well and pumphouse, standpipe and distribution system.
Consulting Engineers:	F. Alport, Orillia and OWRC, Toronto.
Completed:	November 1, 1962.
Estimated Cost:	\$132,000.00

The construction of this project commenced on May 23, and was put in operation October 25.

Corunna (61-S-88)

Description of Project:	A complete sanitary sewer system and the construction of a sewage treatment plant.
Consulting Engineers:	J. D. Nisbet, Sarnia and James F. MacLaren Ltd., Toronto.
Expected Completion Date:	July 1, 1963.
Estimated Cost:	\$752,000.00

Construction of sanitary sewers commenced on October 25, while the work on the sewage treatment plant started on November 5.

Progress on the sanitary sewers was very satisfactory.

Cumberland Township (61-W-94)
(61-S-99)

Description of Project:	Trunk Sewer, lateral sewers, services and temporary outfall sewer.
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Well, feedermain, distribution mains and services.

Consulting Engineers:

Chalmers, McKenzie Assoc.,
Ottawa.

Completed:

June 30, 1962.

Estimated Cost:

\$248,832.73

This stage of the project was completed in June and placed in operation to serve the Queenswood area.

Elmvale (62-S-118)

Description of Project:

Contract 1: Forcemain and
sewage lagoon.

Contract 2: Sewers and pump-
ing station.

Consulting Engineers:

Proctor & Redfern, Toronto.

Expected Completion Date:

June, 1963.

Estimated Cost:

\$180,000.00

Contract 1. Work on the forcemain was 97% completed without difficulty. Wet ground conditions in the lagoon area prevented movement of machinery and work was suspended late in the year until the spring.

Contract 2. Since commencing in November the contractor made very slow progress. The greater part of the sewer was close to a river, a location which resulted in wet trench conditions.

Espanola (61-S-74)
(61-W-72)

Description of Project:

Sewerage system and water
supply system including
primary treatment plant
and water treatment plant
and standpipe.

Consulting Engineer:

R. K. Kilborn & Assoc.,
Toronto.

Completed: October, 1962.

Estimated Cost: \$1,222,304.88

Exeter (61-S-93)

Description of Project: Extension of the existing sewer system, one pumping station, forcemain and lagoons.

Consulting Engineer: B. M. Ross, Goderich.

Expected Completion Date: June 15, 1963.

Estimated Cost: \$292,000.00

Work commenced November 16. Progress during the first months was slow but was expected to improve in 1963.

Town of Fort Erie (59-S-39)

Description of Project: Primary sewage treatment plant, pumping station, trunk sewer and river outfall.

Consulting Engineers: Canadian-British Engineering Consultants, Toronto.

Expected Completion Date: (a) Trunk sewer & outfall:
February 15, 1963.
(b) Sewage treatment plant
& pumping station:
August 12, 1963.

Estimated Cost: \$920,000.00

Construction of trunk sewer proceeded satisfactorily. Difficulties were experienced constructing the river outfall.

The construction of the sewage treatment plant went along on schedule. Foundation difficulties were experienced on the sewage pumping station.

Fort William (60-S-50)

Description of Project:

Contract 'A' - Interceptor
sewers and
forcemains.

Contract 'B' - Windsor Ave.
sewer.

Consulting Engineers:

W. L. Wardrop & Assoc. Ltd.,
Winnipeg.

Completed:

September, 1962.

Estimated Cost:

\$1,503,000.00

Work continued through the winter on the installation of the interceptor sewers (18" to 66" dia.). In the built-up part of the city the sewer was installed in steel sheet-piled trench or in tunnel but in the new development north of the Neebing River a wider unsheeted trench was permissible. The changes in the existing Brunswick St. pumping station were completed.

Work on the Windsor Ave. sewer commenced and was completed in March. The frozen condition of the muskeg ground facilitated work.

The new interceptor sewer system was not to be put into operation until the new sewage treatment plant was completed.



Fort William (61-S-91)

Description of Project:	Contract 'A' - Placing fill at S.T.P. site.
	Contract 'B' - Well point dewatering of site.
	Contract 'C' - Sewage treat- ment plant.
	Contract 'D' - Manufacture of sewer pipe.
	Contract 'E' - Influent and outlet sewers.
Consulting Engineers:	W. L. Wardrop & Assoc. Ltd., Winnipeg.
Expected Completion Date:	July, 1964.
Estimated Cost:	\$2,700,000.00

Contracts 'A' and 'B' were necessary in order to pre-load the site so that most of the settlement would occur before the start of construction. After placing the fill, the well-point system was installed and put into operation in October.

Pipe production for the influent and outlet sewers commenced in November. Tenders for the sewage treatment plant and the installation of the influent and outlet sewers were received November 27, but the contracts had not been executed by the end of the year.

Gananoque (62-S-127)

Description of Project:	Three sewage pumping stations, forcemains, trunk sewer and lagoons.
Consulting Engineers:	Proctor & Redfern, Toronto.
Expected Completion Date:	September, 1963.

Estimated Cost: \$548,467.55

Work commenced late in November on the lagoons with the contractor completing the diversion of the creek around the lower cells by the end of the year. The second contractor moved on to the job late in December to make a start on the 16" forcemain.

Georgetown (61-S-77-2)

Description of Project:	Sewage pumping station.
Consulting Engineers:	Proctor & Redfern, Toronto.
Completed:	October.
Estimated Cost:	\$26,200.00

The wet and dry wells of this pumphouse were installed by a local developer before the Commission awarded a contract for the completion of the superstructure, installation of pumps and a barminutor, and 1,000 ft. of forcemain. This was satisfactorily completed in October.

Goderich (60-W-69)

Description of Project:	Watermains and water treatment plant.
Consulting Engineers:	James F. MacLaren Ltd., Toronto.
Completed:	December.
Estimated Cost:	\$1,031,626.61

Hanover (61-W-73)

Description of Project:	Well and pumphouse and connecting watermain.
Consulting Engineers:	Proctor & Redfern, Toronto.
Completed:	June 1.

Estimated Cost: \$15,000.00

The work was done partly by Hanover P.U.C. and by Carr Construction. It was put in operation June 1.

Hastings (59-W-52)

Description of Project:	Watermains and pumping station.
Consulting Engineers:	Canadian-British Engineering Consultants, Toronto.
Completed:	August 31.
Estimated Cost:	\$206,685.80

King Township (60-W-61A)
(60-W-61B)

"A" Oak Ridges

Description of Project:	Well and pumphouse, standpipe and distribution system.
Consulting Engineer:	V. G. Bardawill, Toronto.
Completed:	February 15, 1962.
Estimated Cost:	\$265,000.00

Construction commenced on April 24, 1961, and the project was completed February 15, 1962.

"B" Schomberg

Description of Project:	Well and pumphouse, standpipe and distribution system.
Consulting Engineer:	V. G. Bardawill, Toronto.
Completed:	January 15, 1962.

Estimated Cost: \$121,000.00

Construction commenced in April, 1961, and was completed in January, 1962.

Kingston Township (61-S-98)

Description of Project: Sewage treatment plant, three sewage pumping stations, outfall sewer, trunk sewer, lateral sewers and house services.

Consulting Engineers: Campbell Smith Ltd., Kingston.

Expected Completion Date: May, 1963.

Estimated Cost: \$1,384,471.00

The trunk sewer and outfall sewer were completed before the end of the year. The lateral sewers and service connections were approximately 70% complete. The wet wells and base slabs for the prefabricated pumping stations were ready for the delivery of the units. The standby generator station for pumping station #2 was completed. All structural work for the digester was completed. Primary, secondary and aeration tanks, together with control building foundations, were completed.

Kitchener (58-S-19)

Description of Project: Extension of existing sewage treatment plant to add secondary treatment.

Consulting Engineers: Proctor & Redfern, Toronto.

Expected Completion Date: June 1, 1963.

Estimated Cost: \$1,750,000.00

Work commenced on August 15, and was 50% completed by the end of the year.

Korah Township (60-S-70)

Description of Project:	Trunk sewers, stage I.
Consulting Engineers:	Proctor & Redfern, Toronto.
Completed:	June.
Estimated Cost:	\$207,920.00

Korah Township (62-S-117)

Description of Project:	Trunk sewers, stage II.
Consulting Engineers:	Proctor & Redfern, Toronto.
Completed:	December.
Estimated Cost:	\$255,000.00

Town of Lindsay (62-S-124)

Description of Project:	Sanitary trunk sewer, sewage pumping station, 14" and 16" dia. forcemains, a six-cell, 110 acre sewage lagoon with outfall to the Scugog River.
Consulting Engineers:	Oliver Lloyd & Assoc. Ltd., Don Mills.
Expected Completion Date:	July, 1963. Weather conditions in the spring would influence completion because of possible wet ground in the lagoons.
Estimated Cost:	\$400,670.00

Construction of the gravity sewer proceeded satisfactorily. The prefabricated pumping station was being constructed in the workshops as the year ended.

The installation of the forcemains, river outfall and the construction of the lagoons proceeded at a slow pace due to ground difficulties.

Markham Township (61-S-97B)

Contract No. 1

Description of Project:	Sanitary trunk sewer, stage 3, from Clark St. to John St., along West Branch of Little Don River.
Consulting Engineers:	Crysler, Davis & Jorgensen Ltd., Willowdale.
Completed:	October 14.
Estimated Cost:	\$45,355.00

The installation of the trunk sewer was completed and put in operation in October. Restoration work was to be carried out after the spring thaw.

Contracts No. 2 and 5

Description of Project:	Installation of sanitary sewers, service connections, storm sewers, catch basins, road restoration work in the Highland Park Subdivision.
Consulting Engineers:	Crysler, Davis & Jorgensen Ltd., Willowdale.
Expected Completion Date:	Uncertain on account of work stoppage. Approx. July 15, 1963.
Estimated Cost:	Contract 2: \$135,760.00 Contract 5: \$440,470.00

Approximately 30% of the work was completed when work was stopped on December 7, because certain work could be done only in warm weather. It was expected that construction work would start up again in the Meadowview District after expected approval of changed drawings.

Markham Township (61-S-97B)

Contract No. 3

Description of Project:	Installation of sanitary sewers and service connections in the Doncaster Subdivision.
Consulting Engineers:	Crysler, Davis & Jorgensen Ltd., Willowdale.
Expected Completion Date:	March 1, 1963.
Estimated Cost:	\$120,320.00

Construction work started officially on November 20, and was proceeding on schedule.

Contract No. 4

Description of Project:	Installation of sanitary sewers and service connections in the Thornhill subdivision.
Consulting Engineers:	Crysler, Davis & Jorgensen Ltd., Willowdale.
Expected Completion Date:	April 22, 1963.
Estimated Cost:	\$91,670.00

The work was proceeding on schedule.

Mersea Township (62-W-101)

Description of Project:	Extension of existing watermains.
Consulting Engineer:	C. G. R. Armstrong, Windsor.
Completed:	December 30.
Estimated Cost:	\$22,000.00

Construction of this project under the Winter Works Incentive Program commenced November 20, and was substantially completed by December 30.

Michipicoten (62-S-106)

Description of Project:	Purchase of existing sewerage system and addition of trunk sewer and stabilization ponds.
Consulting Engineer:	R. S. MacLennan, North Bay.
Estimated Completion Date:	July, 1963.
Estimated Cost:	\$366,550.00

Work commenced on the sewers and lagoon in November and was 70% completed by December 31.

Michipicoten (62-W-105)

Description of Project:	Purchase of existing water supply system from Algoma Ore Properties.
Consulting Engineer:	R. S. MacLennan, North Bay.
Estimated Cost:	\$108,260.00

The consulting engineer made a complete survey of the system and was to prepare detailed drawings. An agreement to purchase was being negotiated.

Neelon & Garson (60-S-65)

Description of Project:	Trunk sewer and lagoons, stage 2.
Consulting Engineers:	Dillon & Lewis, Sudbury.
Completed:	October.
Estimated Cost:	\$771,491.00

Newmarket (61-S-86)

Contract No. 1

Description of Project:	Installation of central trunk sanitary sewer between Mulock Drive and Davis Drive.
Consulting Engineers:	Cumming-Cockburn & Assoc. Ltd., Willowdale.
Completed:	December.
Estimated Cost:	\$126,400.00

The completion of this contract was delayed because the contractor was unable to make connections to the existing system, being held up due to delay in construction of the by-pass north of the Holland River Dam.

Contract No. 2

Description of Project:	Installation of eastern trunk sewer between Srigley Street and MH. 112, near end of Bayview Avenue being the connecting man-hole of the central trunk sewer.
Consulting Engineers:	Cumming-Cockburn & Assoc. Ltd., Willowdale.
Completed:	September 10.
Estimated Cost:	\$62,395.00

Difficult ground conditions were met during construction and a considerable amount of crushed stone was required for bedding.

Newmarket-East Gwillimburg (61-S-87)

Contract No. 1

Description of Project:	Installation of central trunk sanitary sewer between Davis Drive and
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Manhole #118, being the overflow manhole for the Holland River bypass and the influent manhole to the proposed sewage treatment plant for the Town of Newmarket and the Township of East Gwillimbury.

Consulting Engineers:

Cumming-Cockburn & Assoc.
Ltd., Willowdale.

Completed:

September 17.

Estimated Cost:

\$131,000.00

Difficult ground conditions were met on filled-in areas with severe water conditions.

Contract No. 3

Description of Project:

Installation of overflow and bypass sewer, overflow manhole #118 and outfall headwall, north of dam on Holland River.

Consulting Engineers:

Cumming-Cockburn Assoc.
Ltd., Willowdale.

Completed:

December.

Estimated Cost:

\$7,530.00

Wet ground conditions and freezing temperatures were experienced during construction work.

New Hamburg (60-S-56)

Description of Project:

Sanitary sewers, one pumping station, force-main and lagoons.

Consulting Engineers:

McCargar, Filer and
Hachborn, Kitchener.

Expected Completion Date: All stages: April 30,
1963.

Estimated Cost: \$486,000.00

Work commenced October 5, 1961, on stage I, and the municipality managed to add two more extensions to this project within one year by raising substantial cash payments and using all subsidies possible for this kind of work.

Owen Sound (60-S-69)

Description of Project: Interceptor sewers,
pumping station, force-
main and sewage treatment
plant.

Consulting Engineers: Gore & Storrie Ltd.,
Toronto.

Completed: December.

Estimated Cost: \$1,568,451.00

Paris (59-S-34)

Description of Project: Sewage treatment plant.

Consulting Engineers: J. D. Lee & Co. Ltd.,
Kingston.

Completed: November 26.

Estimated Cost: \$201,352.00

Paris (59-S-34)

Description of Project: Sewers and pumping
station.

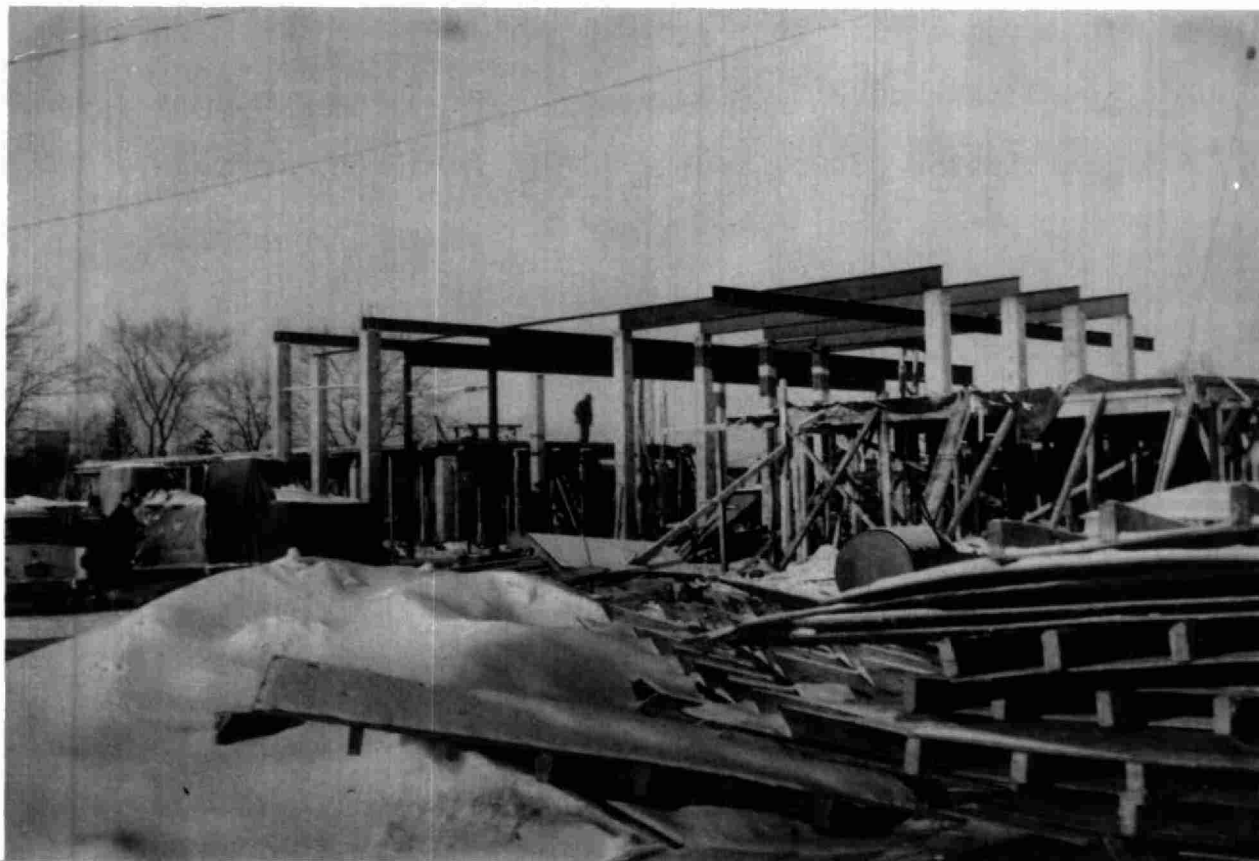
Consulting Engineers: J. D. Lee & Co. Ltd.,
Kingston.

Expected Completion Date: February 28, 1963.

Estimated Cost:

\$485,107.60

At the year-end the general contractor, Johnson Bros. Ltd., had approximately 1,500 lin. ft. of 27" dia. sewer to be installed to complete their contract. Minor clean-up items were to be completed in the spring of 1963.



Petawawa (61-W-90)

Description of Project:

Water distribution system
with water supplied by
existing Department of
National Defence system.

Consulting Engineers:

J. L. Richards & Assoc.
Ltd., Ottawa.

Completed:

September.

Estimated Cost: \$162,021.00

Work on this project was completed in September, portions of the system being placed in operation as the work progressed.

Pickering Township (61-S-92)

Contract No.1

Description of Project:	Installation of sanitary sewer, forcemain, sewage ejector station, service connection in the west Rouge Hill area.
Consulting Engineers:	Proctor & Redfern, Toronto.
Completed:	October 12.
Estimated Cost:	\$282,192.00

Some difficult ground conditions were encountered, and some delays were caused by easements, especially through the west part of the Rouge Hill Golf & Country Club.

Contract No. 2

Description of Project:	Installation of sanitary trunk sewers, forcemains, three prefabricated underground pumping stations and two diesel-generator standby stations.
Consulting Engineers:	Oliver Lloyd & Assoc. Ltd., Don Mills.
Completed:	December.
Estimated Cost:	\$275,000.00

Severe delays were experienced on account of late deliveries of the prefabricated underground pumping stations and the diesel-generator standby units.

Port Arthur (62-S-101)

Description of Project:	Contract 'A' - Extension to trunk sewer.
	Contract 'B' - Extension to S.T.P.
Consulting Engineers:	R. V. Anderson & Assoc. Ltd., Toronto.
Expected Completion Date:	Contract 'A' - Completed Contract 'B' - July, 1963.
Estimated Cost:	\$736,000.00

Work commenced on the trunk sewer in June and was completed by early December. Work on the extensions to the sewage treatment plant commenced mid-November and was about 18% completed by the end of the year.

Port Colborne (60-S-73)

Description of Project:	North-east sewers including sewage lift station and forcemain.
Consulting Engineers:	Canadian-British Engineering Consultants, Toronto.
Completed:	November.
Estimated Cost:	\$360,000.00

Port Colborne (62-S-108)

Description of Project:	Fretz Development. Sewer system including sewage lift station and forcemain.
Consulting Engineers:	Canadian-British Engineering Consultants, Toronto.

Expected Completion Date: July, 1963.

Estimated Cost: \$265,000.00

About 15% of the work was completed by the end of 1962, including excavation, pipelaying, excavation for lift station and forcemain.

Port Credit (61-S-89)

Description of Project: Contract 'A' - sanitary sewers, forcemain and sewage lift station.

Contract 'B' - stand-by power equipment.

Contract 'C' - changes to existing sewage lift stations.

Consulting Engineers: Franklin McArthur Assoc. Ltd., Downsview.

Expected Completion Date: Contract 'A' - Completed.
Contract 'B' - Completed.
Contract 'C' - January, 1963.

Estimated Cost: \$240,000.00

Work commenced in early April but completion was set back by delay in the delivery of the factory-built lift station and by the contractor's financial difficulties. Except for Contract 'C', the works were substantially completed by mid-November.

Preston (61-S-75)

Description of Project: Trunk sewer.

Consulting Engineers: Newton, Dickson & Assoc. Ltd., Willowdale.

Completed: January.

Estimated Cost: \$87,650.00

Rockland (61-W-89)

Description of Project: Feeder watermain from pumping station to standpipe to distribution system and replacement of existing main on the Main Street.

Consulting Engineers: J. L. Richards & Assoc. Ltd., Ottawa.

Completed: October.

Estimated Cost: \$97,852.00

This contract was completed in October, with all parts of the system placed in operation.

Saltfleet Township (62-W-103)

Description of Project: Installation of water-mains in the Fruitland area.

Consulting Engineers: James F. MacLaren Ltd., Toronto.

Expected Completion Date: April 5, 1963.

Estimated Cost: \$406,000.00

The installation of cast iron watermains was proceeding on schedule under the site supervision of the township engineer.

Sault Ste. Marie (61-W-86)

Description of Project: Contract 1 - Construction of a six-million gallon storage reservoir and a booster pumping station to



improve the supply in a low pressure area.

Contract 2 - Construction of 12,000 lin. ft. of 30" watermain from existing pumping station to reservoir.

Contract 3 - Construction of 8,000 lin. ft. of 18", 16" and 12" watermain from the booster pumping station to serve an area of low pressure.

Consulting Engineers:

Proctor & Redfern, Toronto.

Expected Completion Date:

June, 1963.

Estimated Cost:

\$1,300,000.00

Contract 1: Work commenced in June and pouring of concrete proceeded smoothly. Slow deliveries of electrical equipment resulted in a slow-down. As a result, this contract was not expected to be completed until February, 1963.

Contract 2: Laying of pipe was carried on from July to December. Cleaning, testing and chlorinating was to be done in January, 1963.

Contract 3: Difficulties in connection with the location on Ontario Department of Highways property and in connection with the signing of a contract held up the start of this contract. A start was expected before the end of January, 1963.

Seaforth (60-S-60)

Description of Project:	Extension to existing system of sewers and prefabricated pumping station.
Consulting Engineers:	James F. MacLaren Ltd., Toronto.
Expected Completion Date:	June 27, 1963.
Estimated Cost:	\$177,551.69

At the end of 1962, W. A. Haggerty Construction Ltd. had completed approximately 10% of the sewer main installation. The pumping station was to be installed in April, 1963.

Shelburne (60-S-72)

Description of Project:	Sanitary sewers, pumping station, forcemain and lagoons.
Consulting Engineers:	L. Campbell, Orangeville and OWRC.
Completed:	November 1.
Estimated Cost:	\$276,385.00

Construction commenced October 15, 1961, on stage 1. The village added two more stages by substantial cash contributions to complete the sewer system for the whole municipality.

Simcoe (62-S-120)

Description of Project:	Extension and remodeling of the existing sewage treatment plant.
Consulting Engineers:	Proctor & Redfern, Toronto.
Expected Completion Date:	July, 1963.

Estimated Cost: \$620,000.00

About 45% of the work was very satisfactorily completed by the year-end.

Sudbury (60-S-53)

Description of Project:	Sewer tunnel.
Consulting Engineers:	R. K. Kilborn & Assoc., Toronto.
Expected Completion Date:	February, 1963.
Estimated Cost:	\$1,560,000.00

The work was completed with the exception of about 10,000 lin. ft. of invert and the lining of Shaft #2.

Sudbury (62-S-111)

Stages 1 and 2

Description of Project:	Shaft No. 1 and under-ground pumping station.
Consulting Engineers:	Dillon & Lewis, Sudbury.
Expected Completion Date:	June, 1963.
Estimated Cost:	\$750,000.00

Tavistock (61-S-85)

Description of Project:	Sanitary sewers, two pumping stations, force-mains and lagoons.
Consulting Engineer:	R. M. Dawson, Stratford.
Expected Completion Date:	June 1, 1963.
Estimated Cost:	\$354,000.00

Construction commenced June 15, 1962, and considerable progress was made during the first six months. The project was 66% completed by the end of the year.

Timmins (60-S-71)

Description of Project:	Contract 1: Outfall sewer.
	Contract 2: Primary treatment plant.
Consulting Engineers:	Gore & Storrie Ltd., Toronto.
Expected Completion Date:	Contract 1: Spring, 1963.
	Contract 2: October, 1963.
Estimated Cost:	Contract 1: \$109,000.00
	Contract 2: \$607,000.00

Contract 1 for 5,000 ft. of 36" dia. sewer between the old treatment plant and the new one was completed except for clean-up and testing.

Contract 2 progressed slowly owing to difficulties with ground water. A temporary structure enclosing the control building was completed in December.

Twp. of Toronto (61-S-78)

Description of Project:	Sanitary trunk sewer, 30" to 42" dia.
Consulting Engineer:	Township Engineer.
Completed:	July 15.
Estimated Cost:	\$662,000.00

Work continued satisfactorily and the contract was completed well ahead of the required completion date of October 18th.

Twp. of Toronto (61-S-82)

Description of Project:	Contract 'A' - trunk sewer & forcemain.
	Contract 'B' - Beach St. sewage lift station.

Consulting Engineer:	Township Engineer.
Completed:	Contract 'A' - November. Contract 'B' - June.
Estimated Cost:	\$324,600.00

Work continued on Contract 'B' and the contract was completed satisfactorily and put into operation.

Twp. of Toronto (61-W-91)

Description of Project:	Elevated steel water tank.
Consulting Engineers:	Gore & Storrie Ltd., Toronto.
Completed:	December.
Estimated Cost:	\$145,000.00

Work commenced on the foundations for the tank in June and erection of the steelwork commenced in July. The work was substantially completed by December.

Twp. of Toronto (62-W-97)

Description of Project:	66" dia. intake in Lake Ontario.
Consulting Engineers:	Gore & Storrie Ltd., Toronto.
Expected Completion Date:	May, 1963.
Estimated Cost:	\$396,000.00

Work commenced in July with blasting the rock under-water along the line of the intake and the construction of the structures on shore. Lake conditions became too rough in November to work satisfactorily and work was discontinued for the winter.

Trenton (61-S-95)

Description of Project:	Trunk sewers.
Consulting Engineers:	Gore & Storrie Ltd., Toronto.
Completed:	December 19.
Estimated Cost:	\$204,905.29

Vankleek Hill (60-W-66)
(61-S-81)

Description of Project:	Water supply and distribution system and sewerage system.
Consulting Engineers:	Canadian-British Engineering Consultants, Toronto.

Tenders were called for these projects in March with the low tender being for \$699,412.90. This amount was beyond the amount approved by the Ontario Municipal Board. The municipality had not decided by the end of 1962 whether or not to proceed with a portion of the works.

Waterford (62-S-119)

Description of Project:	Sewage system and lagoons.
Consulting Engineers:	Proctor & Redfern, Toronto.
Expected Completion Date:	July, 1963.
Estimated Cost:	\$260,000.00

Work progressed very well on the sewer system, but was slower on the lagoons.

Watford-Wyoming-Plympton (61-W-92)

Description of Project:	Approximately 135,000 ft. watermains and one pumping station.
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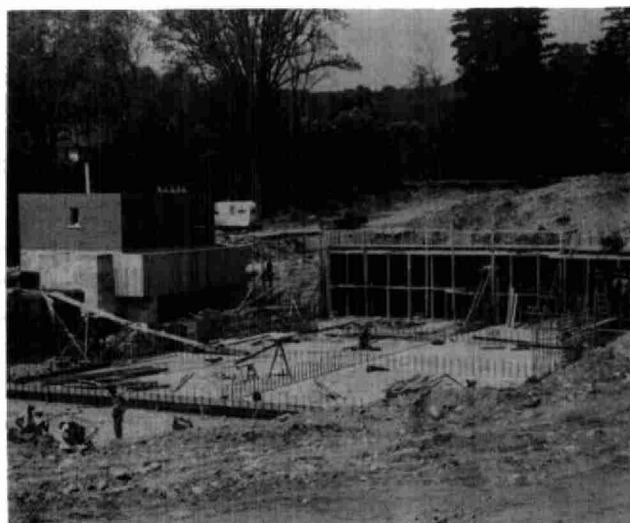
Consulting Engineers:	J. A. Monteith Assoc., Petrolia.
Completed:	November 15.
Estimated Cost:	\$580,000.00

Construction commenced on January 20. The work, qualifying as a winter works project, progressed slowly during the first three months due to weather conditions, but picked up later.

Wellington (60-W-60)

Description of Project:	Pumphouse, watermains and elevated storage tank.
Consulting Engineers:	Gore & Storrie Ltd., Toronto.
Expected Completion Date:	July 22, 1963.
Estimated Cost:	\$259,309.75

The general contractor, Tatham Co. Ltd., was delayed with the installation of the watermains due to heavy frost conditions. However, no difficulty was expected in completing this project within the specified time.



Twp. of Widdifield (61-W-88)

Description of Project:	16,200 ft. of 20", 16", 14" and 12" watermain and fittings.
Consulting Engineers:	Northland Engineering, North Bay.
Completed:	December.
Estimated Cost:	\$214,500.00

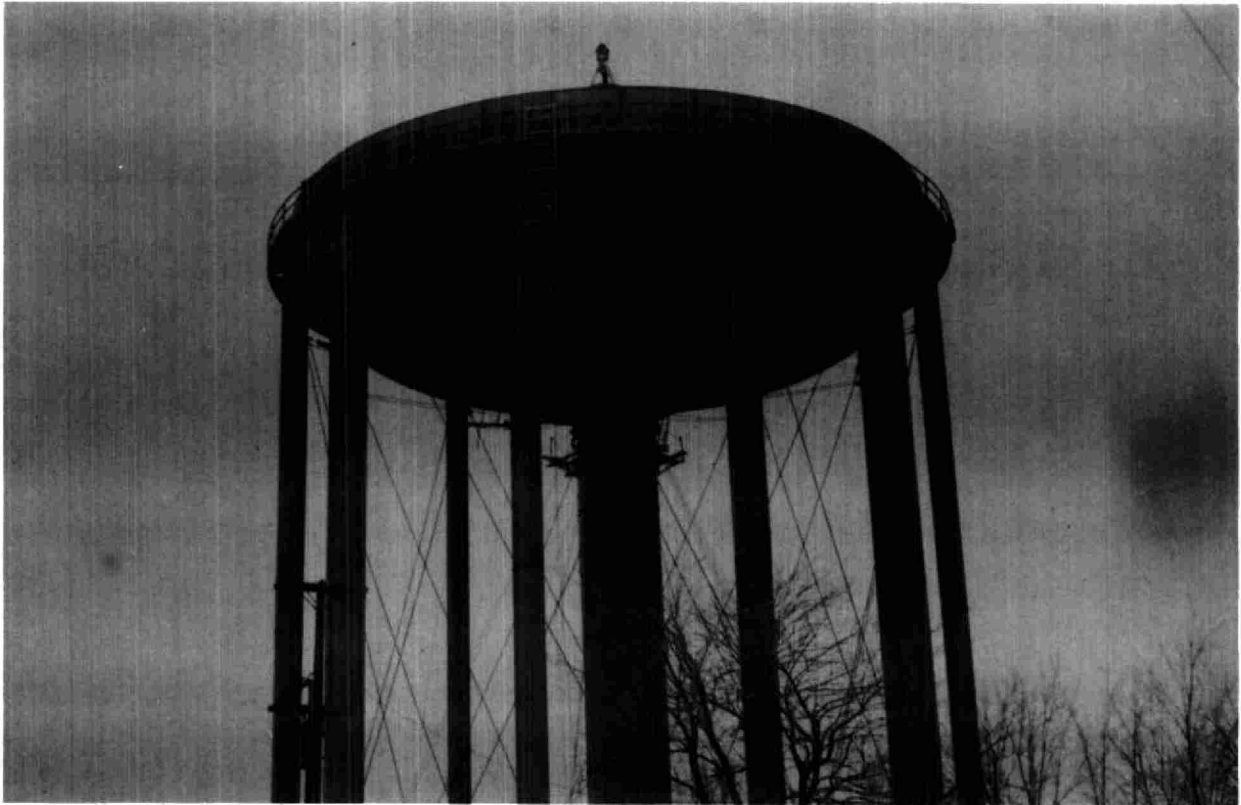
This contract was satisfactorily completed.

Twp. of Widdifield (62-S-103)

Description of Project:	Phase I: 3,400 ft. of 14, 16 and 18 inch sewer, a pumping station and 1,200 ft. of forcemain.
	Phase II: 6,500 ft. of 16, 18, 20 and 24 inch sewer and 2,100 ft. of forcemain and a meter chamber.
Consulting Engineers:	Northland Engineering, North Bay.
Expected Completion Date:	Phase I: February, 1963. Phase II: January, 1963.
Estimated Cost:	Phase I: \$ 73,000.00 Phase II: \$127,000.00 Equipment: \$ 2,500.00

Phase I was taken over by the Commission after tenders had been called by the township. Work carried on through the summer and fall, but was delayed by late delivery of the prefabricated station.

Phase II was completed in the fall well ahead of schedule and with minimum interruption to street traffic.



DIVISION of LABORATORIES

F. A. Voegel, Director
A. J. Harris, Assistant Director

As with other sections of the Commission, the work of this division constantly keeps expanding and the activities of all of the division's branches in 1962 emphasized this. The analytical sections received more samples than in any previous year, the Purification Processes Branch delved into many problems besetting operating and about-to-be-operated water treatment and pollution control plants, the Industrial Wastes Branch discussed a multitude of waste treatment problems with industries across the province, and the Biological Branch combined laboratory analytical work with field activities not only within Ontario but also on boundary waters for the International Joint Commission.

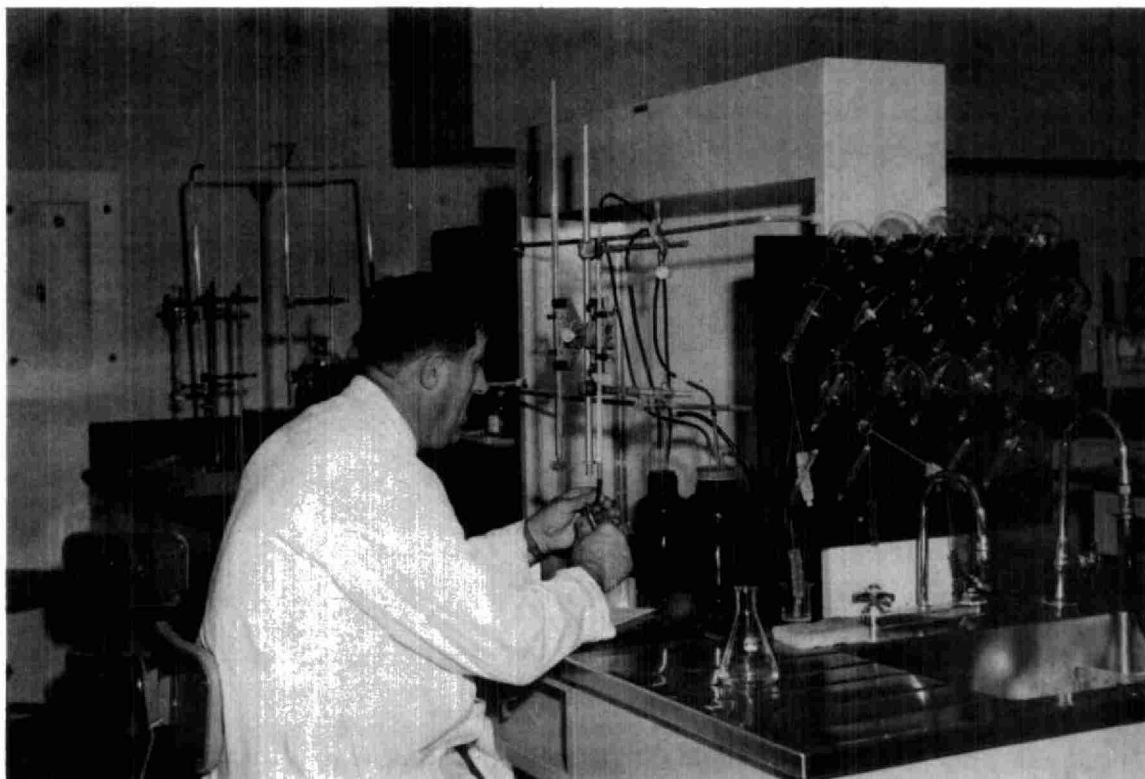
For the branches which carried out most of the analytical work of this division, Bacteriology, Biology, and Chemistry, the following table reveals how the analytical requirements expanded:

<u>Branch</u>	<u>No. of</u> <u>Samples</u>	<u>No. of</u> <u>Samples</u>	<u>Per Cent</u> <u>Increase</u>	<u>No. of</u> <u>Determinations</u>		<u>Per Cent</u> <u>Increase</u>
	<u>1961</u>	<u>1962</u>		<u>1961</u>	<u>1962</u>	
Bacteriology	15,859	19,280	21.6	21,091	28,206	33.7
Biology	407	596	21.9	611	991	62.2
Chemistry	<u>23,860</u>	<u>26,109</u>	<u>9.4</u>	<u>108,449</u>	<u>119,841</u>	<u>10.5</u>
Totals	40,126	45,985	14.6	130,151	149,038	14.5

Though not included in the above table, the work of the Purification Processes Branch also entailed a large number of analyses, both in the field and in the laboratory.

The analyses made by this branch were necessary to carry out the evaluation of the various pieces of equipment, aerators, filters and ion exchange columns which were being considered for installation in treatment plants and to locate the causes of operating difficulty in certain sewage treatment plants.

As can be seen from the table, the largest number of analyses were made by the Chemistry and Bacteriology Branches.



In 1962, the survey work of the International Joint Commission in the investigation of trans-boundary pollution came to an end. The Biology Branch took a large part in the biological aspects of that survey.

To control the application of aquatic herbicides and algicides, the Biology Branch administered the additions to the OWRC Act concerning these chemicals. In co-operation with representatives of the Department of Lands and Forests, the biologists issued permits covering these applications and in many cases supervised or inspected the areas concerned. Fish-kills did occur in trial treatments but these were kept to a minimum by the action of the biologist present during these trials.

Personnel of the Industrial Wastes Branch continued in the follow-up work at various industries across the province to spur the activity of these industries in pollution control. It was by these repeat discussions with industry that steady progress in pollution abatement could be stimulated and maintained.

BACTERIOLOGICAL BRANCH

Although the main function of the Bacteriological Branch was to do bacteriological analysis of water samples for coliform organisms, a variety of other activities and projects were undertaken due to special requests for information, surveys, and/or assistance in resolving water problems. The demand for keeping abreast of current developments in water microbiological research, technical advancements in instrumentation and commercial products for treatment of water and waste materials, was accomplished by assigning personnel to work full-time on these matters with the part-time assistance of technicians for laboratory experimentation. The acquisition of some technical bacteriological journals and texts also aided in this endeavour.

Throughout 1962, there were numerous reports in the scientific literature to indicate that laboratories were devoting a great deal of experimentation for the development of Most Probable Number (MPN) techniques and Membrane Filter (MF) techniques for the isolation and enumeration of fecal coliforms (Escherichia coli) as well as non-fecal coliforms. Periodically, requests were received from engineers and others for this type of analysis in order to permit them to compare results with E.coli tests as conducted by the Ontario Department of Health. Experimental work done in this laboratory and elsewhere has shown that the specificity of these tests for Escherichia coli were not too reliable with the currently used techniques. The demand for improved techniques of isolation and enumerating fecal coliforms as well as information on the interpretation of these tests has been partly met by the addition of a graduate bacteriologist in May who has been conducting investigations on these and other problems associated with laboratory procedures.

The first phase of an analytical training program for technicians was completed in December. The aim of this program was to enable this laboratory to obtain more detailed and specific information regarding the coliform and associated groups of bacteria in samples and to allow for a limited though greater number of these samples to be processed. The training also would permit this branch to more rapidly assess present analytical techniques used to detect pollution indicator organisms by concentrating the efforts of all the technical staff to arrive at recommendations regarding new methods and changes in present procedures. This program was conducted in small segments as time became available. It was immediately useful when applied to E.coli determinations in pointing out possible discrepancies in the generally accepted method.

A program was initiated to locate the areas throughout the province where nuisance organisms such as iron and sulfur bacteria, which cause taste, odor and turbidity problems in water supplies, were present. The collection of material and specimens of slimes from troublesome areas in co-operation with other divisions permitted the investigation of cultural and microscopic characteristics of these bacteria. Improvements were made in the methods of cultivating the organism Sphaerotilus natans, but several problems remained unsolved particularly the suppression of other organisms found associated with it. The accumulation of specimens and information pertaining to the occurrence and growth of these nuisance bacteria should provide a better understanding of them and lead to preventative control measures being formulated. This work was temporarily interrupted by the return to university of R. T. Thorup who was conducting this program.

Enzyme preparations advertised as being capable of curing malfunctioning sewage treatment systems and septic tanks were received from time to time for examination. Analyses to determine their composition and effect on sewage, particularly on animal fats and oils were conducted on a modest scale. The results of these experiments and documented data on their value from informed sources will be incorporated in a future report. A literature survey, nearing completion by December, indicated, practically without exception, that these products were ineffectual for the purposes claimed by manufacturers.

An important phase of the work this year involved several troubleshooting projects in the field. An investigation was made of taste, odor and slime problems experienced in the water system of a Cookstown gasoline service station. A slime problem at Simcoe was undertaken in conjunction with the District Engineering Branch. Requests for "same-day" determinations of the presence of coliforms were made in connection with sterilization of mains. This analysis was conducted in a rapid and efficient manner due to previous consultation which permitted arrangements to be made for early delivery of the test sample to the laboratory. Results were available the same day. The tracing of a sewage plant effluent at Crystal Beach, the investigation of a slime problem in a London water supply (Trowbridge Wells) and the sampling of a water distribution system at Brantford where persistent, low coliform counts had been observed, constituted other field problems requiring the immediate attention of this branch. The bacteriological results of an intensive monthly survey conducted from March to August on the mouth of the Niagara River were compiled and a report prepared for the International Joint Commission.

Swimming pool filter media efficiency studies, under the direction of the Purification Process Branch, were partially evaluated by making bacterial counts. The various procedures used for counting bacteria such as standard place count, MF plate counts and others, were reviewed for their ease and efficiency in processing large numbers of samples. A new technique known as the "drop plate" method was found to be rapid and simple to perform as well as providing accurate and reproducible results. This method allowed a larger number of samples to be handled than by other conventional techniques.

A number of requests for special laboratory analysis work were received this year. Eleven water samples were submitted by the M.O.H. at Sundridge and some of these contained a growth of an iron bacterium (Gallionella). The growth of this organism in soft water under acid conditions was considered unusual. A sludge sample was submitted for the determination of the presence of pathogenic bacteria. Requests for analysis of water for the virus of Infectious Hepatitis were received, but any attempts for the detection of this agent were prevented by the lack of suitable tests. Information regarding the disease "Leptospirosis" was collected and reported. One method of contracting this disease was found to be by exposure to contaminated water which was, in recent years, causing concern to public health officials.

Several pieces of new equipment were obtained this year which considerably increased the efficiency of the branch. Twelve student microscopes received in June permitted the extension of practical laboratory experience in biological and bacteriological preparations for the various courses the Commission undertakes with water and sewage works operators. The procurement of photomicrographic equipment to record the morphological features of nuisance bacteria and other organisms should provide valuable reference material for identification and demonstration purposes.

The installation of a glassware washer in the bottle-washing room speeded up the operation performed by this section. This washer incorporated a distilled water rinse in the final washing cycle, giving a greater degree of chemical cleanliness than was achieved by the previous method. Data accumulated during its initial month of operation indicated an excellent overall efficiency of 94 per cent.

Table I

COMPARISON OF SAMPLES ANALYSED IN 1961 & 1962

<u>Classification of Samples</u>	<u>1961</u>	<u>1962</u>	<u>Percentage</u>
Total Samples	15,594	19,280	23.6
No. of Water Samples	6,466	10,926	69.0
No. of River Samples	6,952	4,191	(-39.7)
No. of Sewage Samples	2,818	3,909	38.7
Others	358**	254*	

* excludes samples also requiring coliform analyses - counted elsewhere.

** includes samples also requiring coliform analyses - not counted elsewhere.

A 23.6% increase in total samples was received in 1962 over 1961 (see Table I). Most of these were drinking water samples representing 69.0% more than submitted in 1961. These increases resulted from sampling programs by the OWRC staff and the submission of samples by the public. A decrease of 39.7% was evident in the surface water sample submissions, while a 38.7% increase in sewage samples was noted. The decrease indicated in the surface water sample submission was due to a curtailment of program by the laboratory (dropping the Port Dauphine sampling and analyses program for the Great Lakes) and by the field staff.

Table II

COMPARISON OF NUMBERS OF DETERMINATIONS CARRIED OUT IN
1961 & 1962

<u>Determinations</u>	<u>1961</u>	<u>1962</u>
Membrane Filter	15,609	20,031
Most Probable Number	1,149	533
E.coli	1,058	508

Indicated Number	929	25
Slides (Approx.)	300	427
Plates (Approx.)	418	1,465
Others (Approx.)	<u>1,034</u>	<u>5,217</u>
Total	<u>20,497</u>	<u>28,206</u>

The number of samples analysed for coliform organisms by the Membrane Filter technique increased proportionably to total number of samples submitted. There were fewer requests for analyses by the Most Probable and Indicated Number techniques where the samples submitted were reduced by approximately 50%. The Indicated Number Coliform count, a very inaccurate method of estimating bacterial densities, was virtually replaced by the more accurate Membrane Filter counting technique. The number of microscopic slides, cultural plate counts, and other determinations were only approximated because of the specialized use of these methods. A sizeable increase in the use of plating techniques was to be noted. This was due to the development of a more accurate procedure in identifying members of the coliform pollution-indicator-group of bacteria. Along with these tests was an increased use of biochemical identification tests which were counted together in the "other" category. All of the work in this area has led to more precise typing of coliforms and was a technique used in specialized cases where routine analyses did not present the entire picture of pollution. An overall increase approximately 40% in numbers of determinations was noted over the numbers carried out in 1961.

Table III

PERCENTAGE OF SAMPLES SUBMITTED BY OWRC DIVISIONS AND BY
THE PUBLIC - By Actual Count of Typical Months

	<u>1961</u>	<u>1962</u>
Laboratory	4.0	7.4
Plant Operations	15.1	11.8
Sanitary Eng.	44.3	37.5
Water Resources	2.9	1.0

Table III

(Cont'd)

PERCENTAGE OF SAMPLES SUBMITTED BY OWRC DIVISIONS AND BY
THE PUBLIC - By Actual Count of Typical Months

	<u>1961</u>	<u>1962</u>
Construction	1.3	(None submitted in months involved)
Public	<u>32.4</u>	<u>42.3</u>
Total OWRC	<u>67.6</u>	<u>57.7</u>

The curtailment of OWRC program was readily apparent in the total numbers of samples submitted by the OWRC field staff. This was reduced from 67.6% in 1961 to 57.7% in 1962. Submission of samples from the public continued to grow in 1962 as the services of the Commission became better known. The increase in numbers of laboratory samples by 3.4% over 1961 was mainly due to the requests for analyses and survey of Lake Ontario in the area around Toronto. This represented an increase of 802 samples over 1961 submission which totalled 624.

Further analysis of the sources of these samples was indicated in the following breakdown in the number of public samples. The majority of these (39.2%) emanated from water and sewage treatment plants through the operator or town officials. Some of these plants came under the jurisdiction of the Ontario Water Resources Commission later in the year, and wherever possible, were excluded from this public category. Public utilities commissions and medical officers of health submitted a good proportion of these samples which dealt with problems in their municipalities (taste and odor, slime, etc.). The Department of Lands and Forests and conservation authorities also utilized the services in conduction of pollution abatement programs on streams and in recreation areas. The armed forces through Ontario submitted 6.0% of these public samples. The remainder, 17.0%, were submitted by individuals with private water supplies, other government agencies such as (Ontario Hydro, the Department of Highways and Ontario Hospitals) and manufacturers plagued with water supply problems.

The peak months of work each year since the infancy of the Commission always has been August, and in 1962 - 2,949 samples were submitted on which 3,948 determinations were conducted. Had the Commission increased its sampling activities according to past years (39% in 1961 over 1960) the staff in the employ of the Commission in this section would not have been able to analyze all of the samples. On several occasions throughout the summer it was found increasingly difficult to analyze all of the samples the same day. The limiting factor in handling such a large number of samples was found to lie in the number of staff available.

During the latter part of the year an estimate was made of the number of samples to be processed in 1963. The figures for this estimate were supplied by the various OWRC divisions involved and the number of public samples was calculated according to the increase in former years. The expected total was found to be 36,287 samples and a breakdown of this total is indicated in the table below.

Table IV

NUMBERS OF SAMPLES AS EXPECTED TO BE SUBMITTED
IN 1963

Sanitary Engineering	19,936
Plant Operations	2,614
Laboratory	1,200
Water Resources	484
Construction	248
Public	11,805

The minimum staff required to handle these samples also was calculated and to the end of 1963 numbered 14 permanent and nine casual. This proposed program represented a 90.5% increase over the 1962 program.

Graph No. 1 indicates the relative frequency of water, river and sewage samples processed in 1962. A steady ever increasing number of drinking water samples which overshadowed

the quantity of river survey samples (which formerly formed the largest number) is the outstanding feature of this graph. The distribution of the work load more evenly throughout the year enabled the staff to process a larger volume of samples.

Graph No. II indicates yearly totals of samples since 1957 and presents a visual comparison of the work done. Estimated total samples in 1963 also is presented for comparison.

BIOLOGY BRANCH

The Biology Branch continued to play an important part in the Commission's water pollution control and water supply program. Biological studies can assess the potential hazards of municipal, industrial or pesticide pollution by testing their direct effect on fish and, can, in the field, determine the biological health of waters receiving these materials. With respect to the water supply program of the Commission, this branch was frequently called upon to determine the cause of taste and odor problems or filter clogging difficulties and make recommendations for the correction of these conditions.

In 1962, a change was made in the OWRC Act which made it illegal to apply any substance to water for the purpose of controlling an aquatic nuisance without the authority of a permit. The Biology Branch was given the responsibility of administering this section of the Act. In order to administer this responsibility effectively, it was necessary to become completely familiar with all the chemicals used for the control of aquatic plants, insects, fish, snails, leeches, and other nuisance organisms. Much of the necessary toxicity information was not available and it was necessary to run bio-assays on 22 formulations to determine their toxicity to fish. No information was available on the taste and odor effect on water supplies and to determine this, seven of the most objectionable chemicals were tested to establish the minimum detectable concentration. Much of this was original information and a paper was to be presented to the Aquatic Nuisance Control Conference in Chicago early in 1963 on the results of this study. As this permit system was new legislation, a conference was organized which brought together representatives of the chemical industry, commercial applicators and interested government agencies. In the first year of operation, 139 permits were issued. In general, the program went well.

GRAPH I.
**COMPARISON OF WATER, RIVER AND SEWAGE
SAMPLES RECEIVED IN 1962**

1,500

1,000

500

100

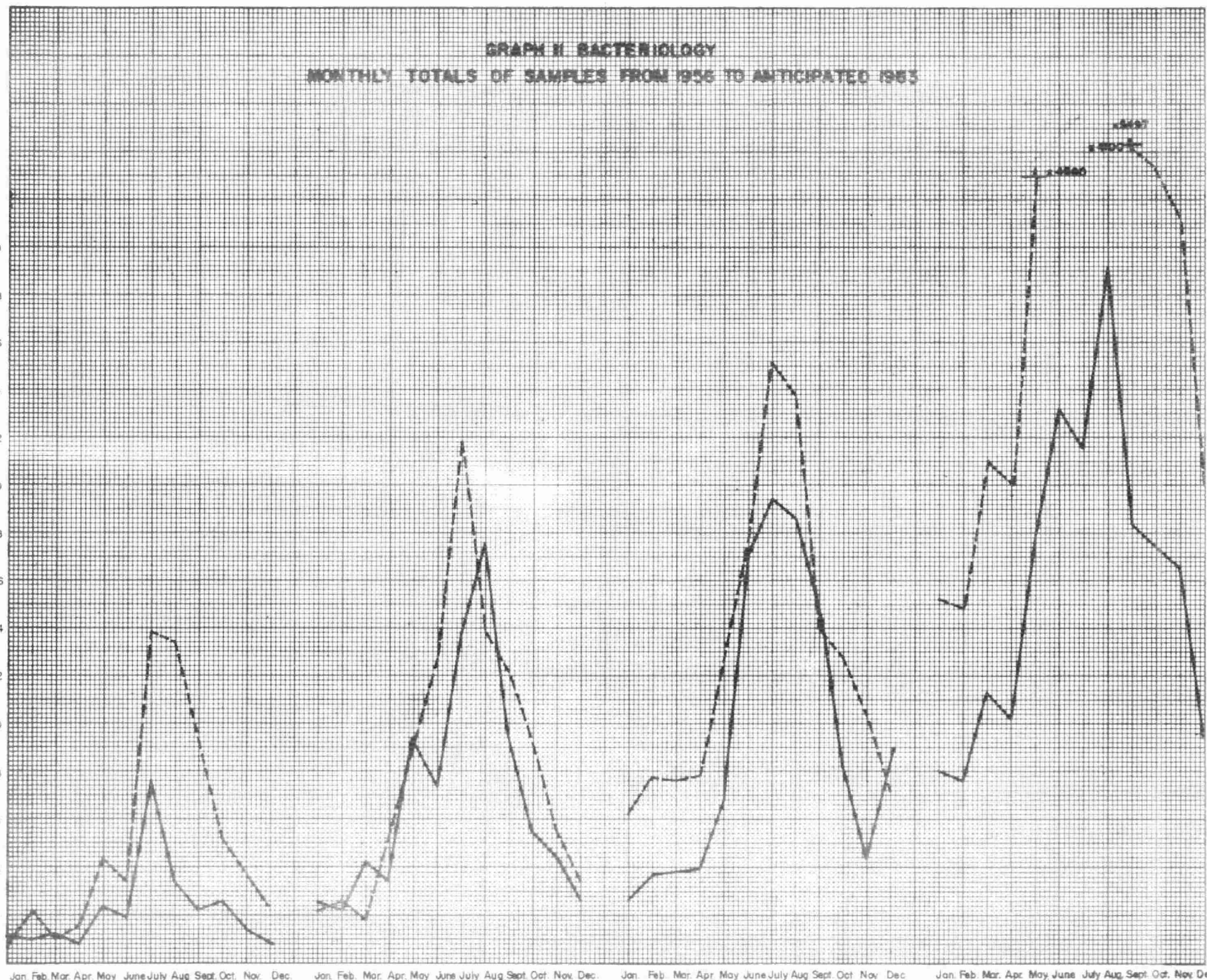
WATER
RIVER
SEWAGE

JAN. FEB. MARCH APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.



GRAPH II. BACTERIOLOGY
MONTHLY TOTALS OF SAMPLES FROM 1956 TO ANTICIPATED 1963

NUMBERS X 100



The studies relating to the control of nuisances caused by the algae *Cladophora* were continued in 1962. Prior to this year, many chemicals had been field tested. Some showed promise though variations in their effectiveness were noted. In order to try to determine the cause of these variations, a laboratory procedure was devised to test their effectiveness under varying conditions of concentration, time of exposure and water temperature. This procedure also enabled the screening of new chemicals and comparing their effectiveness to known algicides without resorting to expensive and time-consuming field tests. Better control was established on the basis of these investigations and a recommendation and cost figure was available for *Cladophora* control. The cost was rather high and until some cheaper chemical became available it likely would not be economical to treat much of the affected shoreline. For this reason, some preliminary investigations were made into the feasibility of mechanical collection and disposal. This appeared to be a practical solution in many but not all areas and a proposal was made for a research study to devise suitable machinery.

During 1961 and 1962, the Commission participated in a pollution investigation for the International Joint Commission. A co-operative biological investigation with increased scope was developed under the immediate direction of the OWRC biologist and a U.S. Public Health Service biologist. Their responsibilities included staff acquisition, general direction and the preparation of the report to the Advisory Board of the I.J.C. This report was prepared and submitted, but the results had not been made available for publication by the end of the year.

Apart from these larger studies, a considerable number of investigations were made often in co-operation with or at the request of Sanitary Engineering, Operations Division or the Industrial Wastes Branch. These investigations included 13 taste and odor and 14 filter clogging problems in public water systems. Three rivers were examined to determine the effects of pollution and a number of fish-kills were either investigated or tests done in the laboratory on suspected toxic waters. The Toronto-Hamilton area lakefront and Toronto harbour surveys were organized by this branch and with the assistance of staff from other laboratory branches, 18 sampling trips were made by Commission boat from Port Credit to Hamilton and three from Mimico to the eastern beaches.

There is a considerable demand on the biological staff to give lectures, talks and present scientific papers. In the year under review, 20 lectures were made to miscellaneous groups. Papers specifically dealing with algae and pollution biology were presented to six other groups.

In addition to the field work a large number of samples were handled. The sources of these samples follow:

1. Biology Branch	180
2. Sanitary Engineering	101
3. Plant Operations	72
4. Other OWRC Branches	35
5. Other Agencies (I.J.C., Municipal, Health Units)	142
6. Public	<u>66</u>
Total	<u>596</u>

Of particular importance, was the increasing demand for routine algae counts of municipal water supplies where taste and odor producing organisms are expected and from oxidation ponds to determine the seasonal variation of algae. The algae counts require one to three hours each to complete and as a result of the large increase in this type of sample the branch has been unable to keep up, and at the year-end 112 preserved samples remained to be done.

The staff of the Biology Branch consists of three biologists and one technician. It was anticipated that one biologist would be added during the year but as the Laboratory Division could not increase their establishment in 1962 it has been difficult to keep up with the work. The additional duties entailed in administering the aquatic nuisance control permit system and a 30% increase in samples resulted in a back log of samples waiting for algae counts and a delay in the preparation of some reports.

Summary of Samples Received - 1962

Algae Counts	248
Benthos	54
Toxicity Bioassays	126
Other Examinations	<u>168</u>
Total	<u>596</u>

Summary of Samples Received - 1962 Cont'd.

Increase over 1961

31.7%



CHEMISTRY BRANCH

Efforts of the Chemistry Branch throughout the year were devoted almost wholly to routine analytical work.

	1961 Total (including Field) (Laboratories)	1962 Total *	Increase
Samples Received	23,860	26,109	2,249 (9.4%)
Test Performed	108,449	119,841	11,392 (10.5%)

* Field work for the International Joint Commission and for the Great Lakes Institute was suspended. Only surveys which could be undertaken from the Laboratory, such as the Lake Ontario sampling surveys, were continued.

Even so the demand for analyses could not be met. Two factors limiting the chemical laboratory's capacity curtailed the number of samples which could be processed.

- (a) Shortage of B.O.D. bottles which limited the numbers of B.O.D. tests and hence the numbers of sewage, river and industrial waste samples which could be analysed. A delivery of new bottles in September alleviated this problem.
- (b) As in previous falls, (and springs) the numbers of incoming samples during the fall of 1962 exceeded the analytical capacity of the laboratory staff, requiring curtailment of planned sampling programs.

It was estimated these limitations required the cancellation of over 3,000 samples which were planned for collection during 1962.

Analytical Technique Revisions

None were completed during the year. An improved method for the determination of suspended solids employing glass fibre filters was tentatively adopted, but tests establishing the validity and scope of the method were needed. Promising new methods for the determination of fluoride and sulphate, two time-consuming tests were partially evaluated.

The laboratory was some years behind the times in the methods employed. Without continual improvement in methods, and evaluation and adoption of applicable analytical developments, efficiency and reliability of laboratory work suffered.

Carbon Adsorption Unit Studies

Sampling with the only carbon adsorption unit in operation (at Hamilton) was suspended during the year. Processing of accumulated samples was completed and a progress report prepared. Continuation or expansion of these studies with the additional sampling units being assembled would depend largely on the availability of staff for this work.



Analytical Reports

Sample accumulations and report delays, previously a problem, were closely controlled during 1962. During most of the year analytical work and report typing was kept up to date. Even during sample overloads throughout the fall, accumulations of samples or of reports were kept to less than one week, and then immediately eliminated.

Samples, Other Than Those Collected By The Staff of the OWRC

The laboratories have always examined samples from the "public", that is, other than those submitted by employees of the OWRC or previously, the Sanitary Engineering Division of the Department of Health. Many of these, such as the monthly samples from municipal sewage treatment plants, were submitted at the request of this division. The analytical results on most other samples were of interest and value, and, retained in the central files, allowed field staffs to be kept informed on problems and developments of which they might not otherwise have been advised.

In the chemical laboratory, as recently as 1958, samples collected by the OWRC staff were only approximately one-half of the total of samples analysed.

This proportion increased so that in recent years OWRC-collected samples made up two-thirds of the total, 63% of the total during 1962. OWRC sponsored and collected samples together accounted for at least 85% of the total during 1962.

Although 15% of the total of samples were requested by outside agencies, this proportion varied widely among the various types of samples as shown in the following tabulation:

Type of Sample	Collected + by OWRC Staff	Arranged + by San. Eng. Div. (Estimate)	Submitted + by Others	= Total
Sewage	7,909 (64%)	3,761 (30%)	707 (6%)	12,377
Water	3,378 (46%)	1,942 (26%)	2,015 (28%)	7,335
River	3,956 (76%)	--	1,241 (24%)	5,197

Industrial Wastes	1,200 (100%)	--	--	1,200
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Yearly Total	16,443 (63%)	5,703 (22%)	3,963 (15%)	26,109
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Water Samples

Both the number and the proportion of water samples analysed for outside agencies were a large portion of the total. This reflected the generally greater concern over the quality of water before use, rather than after. The majority of these samples were submitted in an attempt to overcome a problem with the quality of a water supply or to evaluate a new water supply. A smaller proportion, and these were mainly from municipal authorities, were repetitive checks on water quality, rather than for particular problems.

Sources of Water Samples - Outside Agencies

Municipal Authorities--an appreciable proportion of water samples, in the neighborhood of 10%, were sent in by municipalities in addition to those requested by the OWRC Sanitary Engineering Division.

The remaining 18% of these water samples were sent in from a diverse collection of samplers, whose only common feature was that they were users of water. Each individual agency listed below accounted for up to two per cent of the water samples submitted.

Dominion Government - Department of National Defense.

Ontario Government - Department of Lands & Forests - Conservation Authorities.

- Department of Health - Health Units.

- Department of Mines.

- Department of Highways.

Industries and - International Nickel, Continental Can, Canadian
Business Industries Ltd., Bell Telephone, Trans-Canada
Pipelines, Fort Motor Co., various pulp and paper
firms, mines, railways, etc.

Hospitals

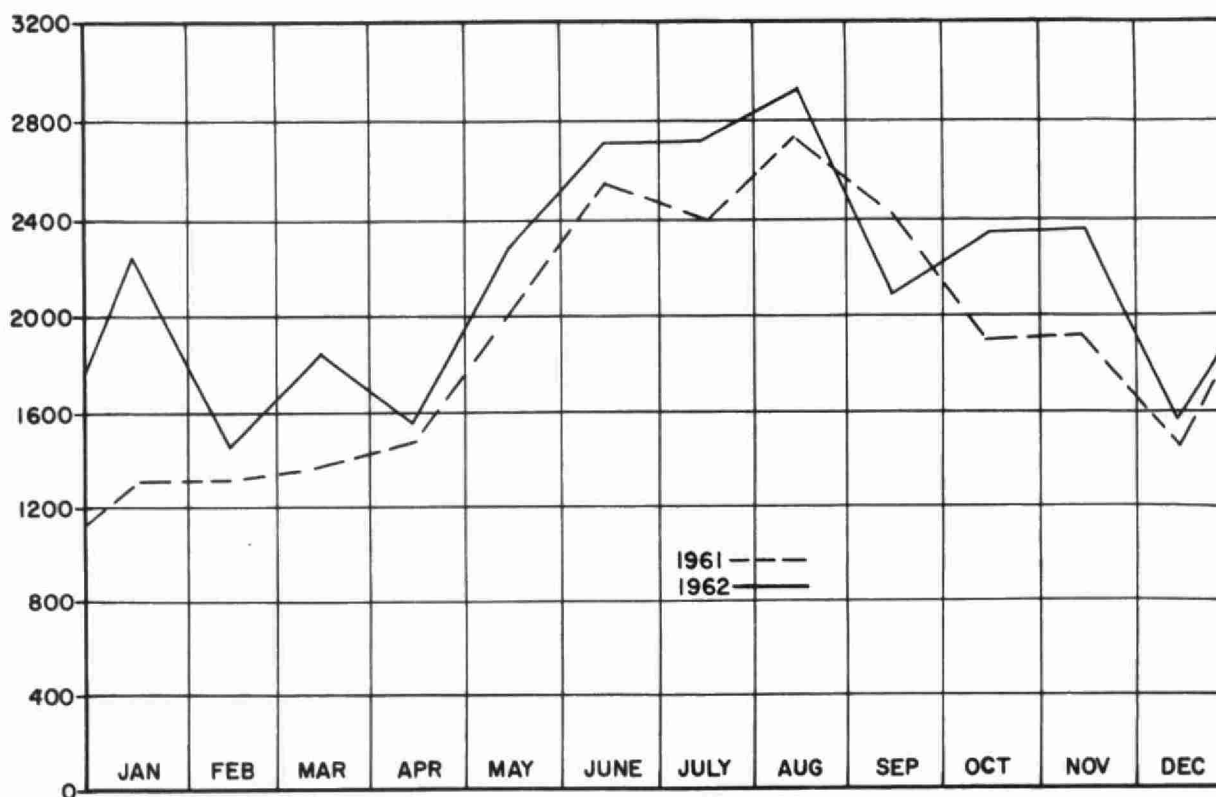
Private Individuals

Consulting Engineers

MONTHLY SAMPLE TOTALS

CHEMICAL LABORATORY

COMPARISON 1961-1962



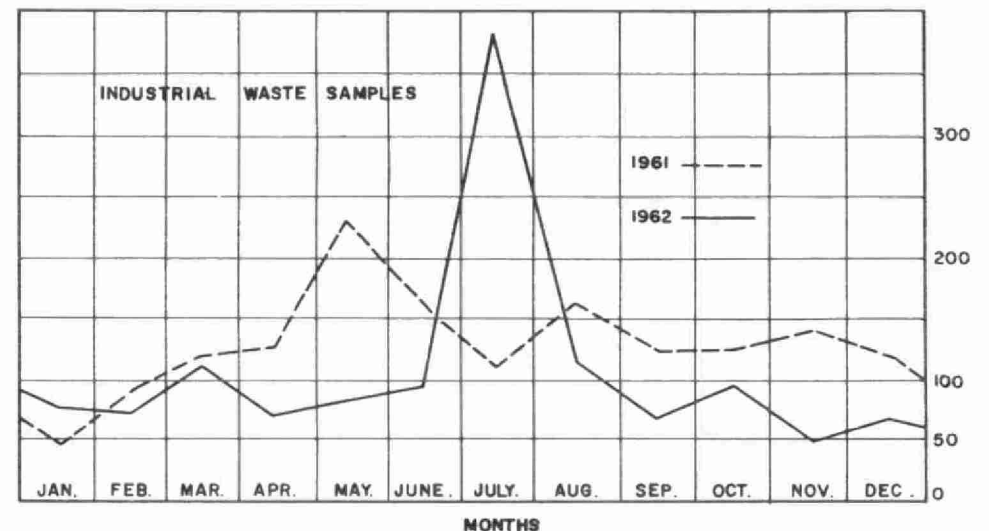
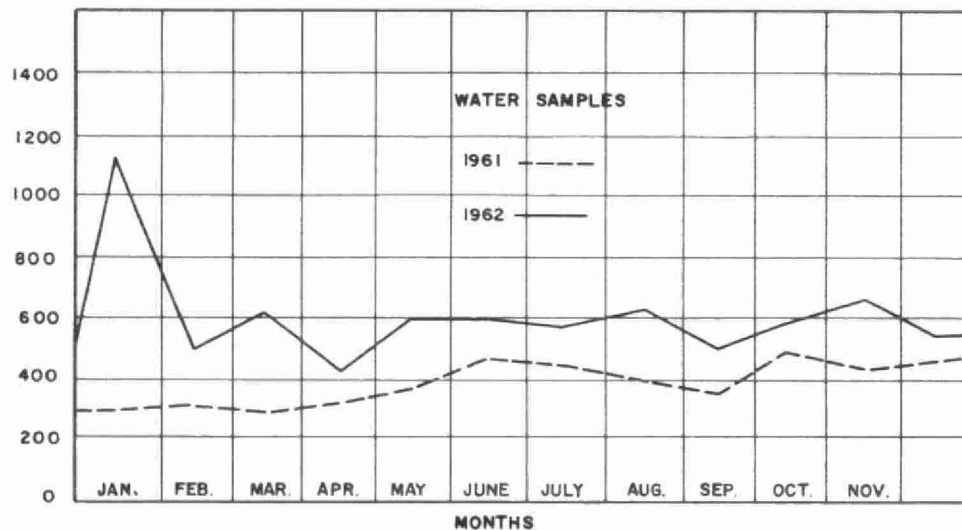
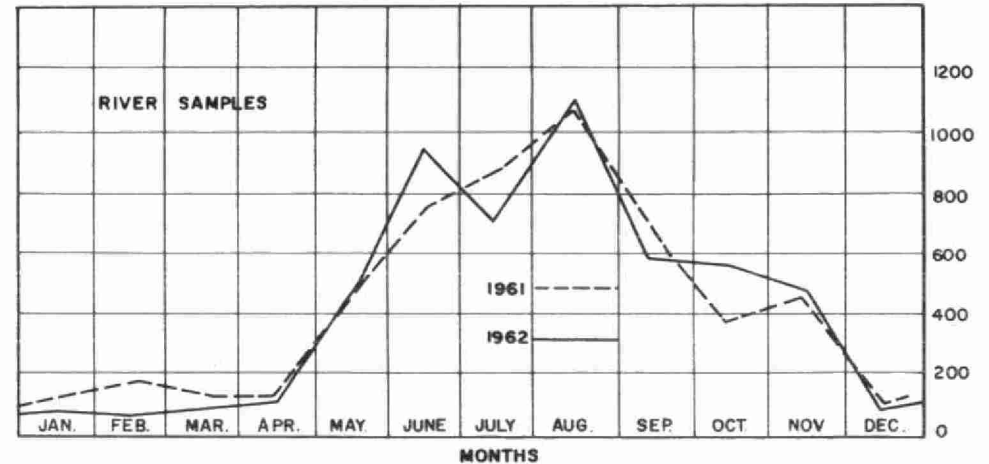
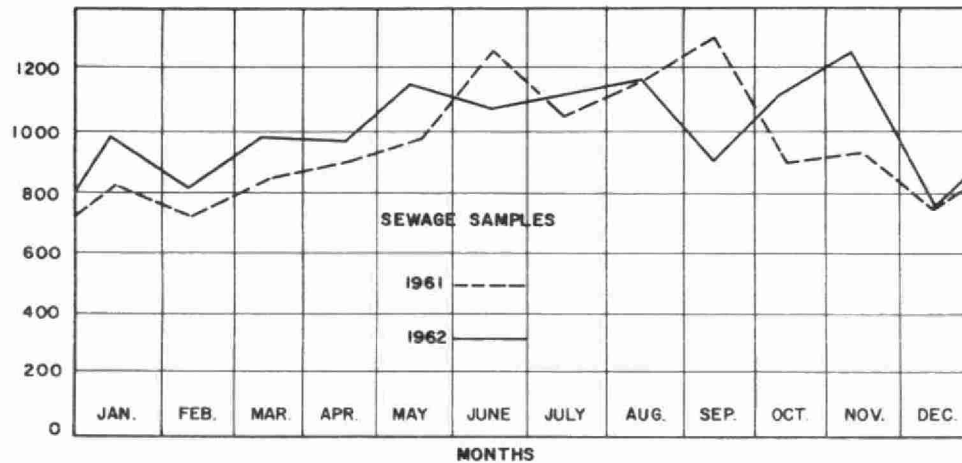
MONTH	NUMBER OF SAMPLES RECEIVED	
	1961	1962
JANUARY	1286	2281
FEBRUARY	1291	1435
MARCH	1362	1817
APRIL	1459	1576
MAY	2008	2289
JUNE	2583	2719
JULY	2398	2736
AUGUST	2734	2979
SEPTEMBER	2401	2039
OCTOBER	1863	2368
NOVEMBER	1896	2387
DECEMBER	1403	1486
TOTAL	22684	26109

GRAPH 1

CHEMICAL LABORATORY

INCOMING SAMPLES

MONTHLY VARIATIONS BY TYPE OF SAMPLES



SEWAGE SAMPLES: WASTE WATERS, INCLUDING OWRC AND OTHER SEWAGE TREATMENT PLANT SAMPLES

WATER SAMPLES: SAMPLES OF GROUND AND SURFACE WATER SUPPLIES AND SYSTEMS

RIVER SAMPLES: POLLUTION TESTS ON SURFACE WATERS, INCLUDING "STREAM" SAMPLING PROGRAM

INDUSTRIAL WASTE SAMPLES: THOSE COLLECTED BY THE INDUSTRIAL WASTE BRANCH ONLY

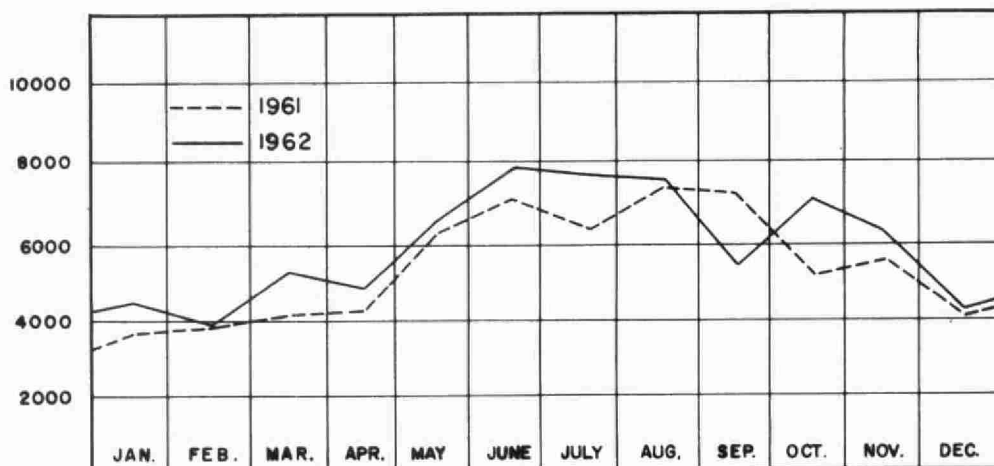
YEARLY TOTALS

	1961	1962	INCREASE
—	11,441	12,377	936 (8%)
—	4,527	7,335	2,808 (62%)
—	5,235	5,197	-38 (-1%)
—	1,481	1,200	-281 (-19%)

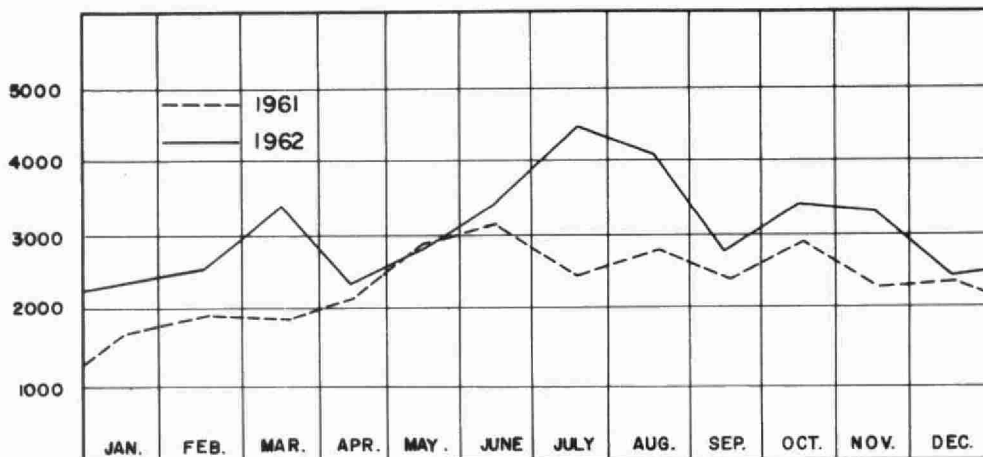
GRAPH II.

CHEMICAL LABORATORY MONTHLY RECORD

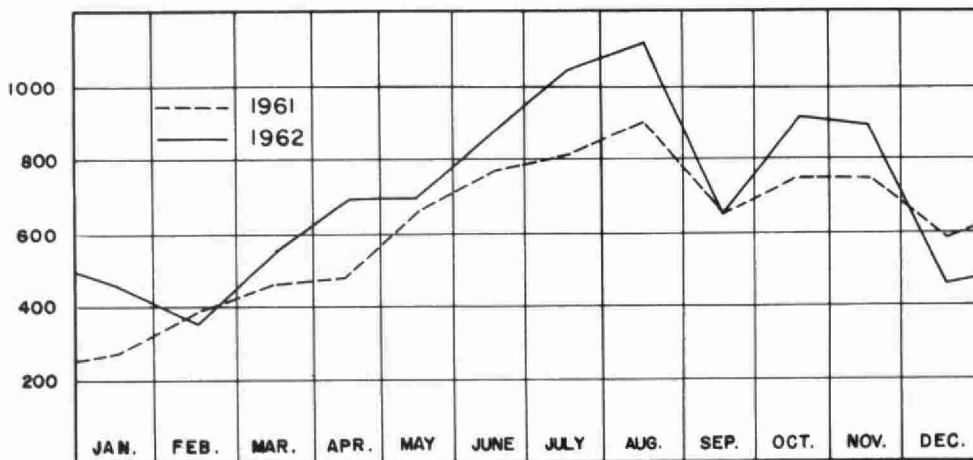
NUMBER OF TESTS PERFORMED BY EACH SECTION



SEWAGE SECTION : BASIC WASTE WATER AND POLLUTION TESTS, INCLUDING BOD, SOLIDS AND NITROGEN DETERMINATIONS.



WATER SECTION : WATER SUPPLY, MINERAL QUALITY TESTS INCLUDING HARDNESS, PH, IRON, FLUORIDE, ETC.



INDUSTRIAL WASTE SECTION : IDENTIFICATION AND MEASUREMENT OF SPECIFIC CONTAMINANTS BOTH TOXIC AND DELETERIOUS, INCLUDING ORGANICS, TOXIC METALS, ETC.

River Samples

Appreciable numbers of these samples were submitted in addition to those collected by the OWRC. Approximately one-half of the additional river samples were obtained from the Department of Lands and Forests as part of the Patricia Lakes Study, which was a comparative assessment of fish productivity of lakes throughout the Province. This department provided a student during the summer for the analytical work on these samples. A few additional samples were submitted by the department in a co-operative investigation of fish-kills, and surface waters in mine areas.

The majority of the remaining samples were provided by conservation authorities throughout the Province to evaluate the condition of watercourses under their jurisdiction.

A few samples were submitted by the Great Lakes Institute, by cottage owner associations, by local Health Units and by private individuals.

Sewage Samples

Only a relatively small proportion of these samples were not directly sponsored by the OWRC. The majority of these additional samples were sent in by municipalities in an effort to evaluate the effect, or identify the source of industrial waste discharges to storm and sanitary sewers.

Evaluation of Graphs

Graph I - Monthly Sample Variations: The previous trend toward a broadening of the summer peak load of samples towards a more level inflow of samples throughout the seasons, including fall, winter and spring continued markedly in 1962. This was in part due to the limitation of summer sampling of sewage and rivers imposed by the shortage of B.O.D. bottles.

A consistent level of incoming samples would allow the laborator's physical capacity to be continuously employed, but would require a work force of analysts and technicians rather than a large proportion of casual student employees.

Graph II - Monthly Variation in Types of Samples: Water samples revealed the most pronounced increase, continued from 1961. This increase alone accounted for most of the additional samples

handled during 1962, and could be attributed mainly to the increased sampling of municipal water supplies, both by and for the OWRC Sanitary Engineering and Plant Operations Divisions.

The graphs for both sewage and river samples show the limiting effect of the shortage of B.O.D. bottles during the summer. In the case of sewage samples this limitation was offset to some extent by an intensification of sampling during the fall giving an overall increase of eight per cent. This resulted in a peak of samples during November, with which the permanent staff of the laboratory had difficulty in coping.

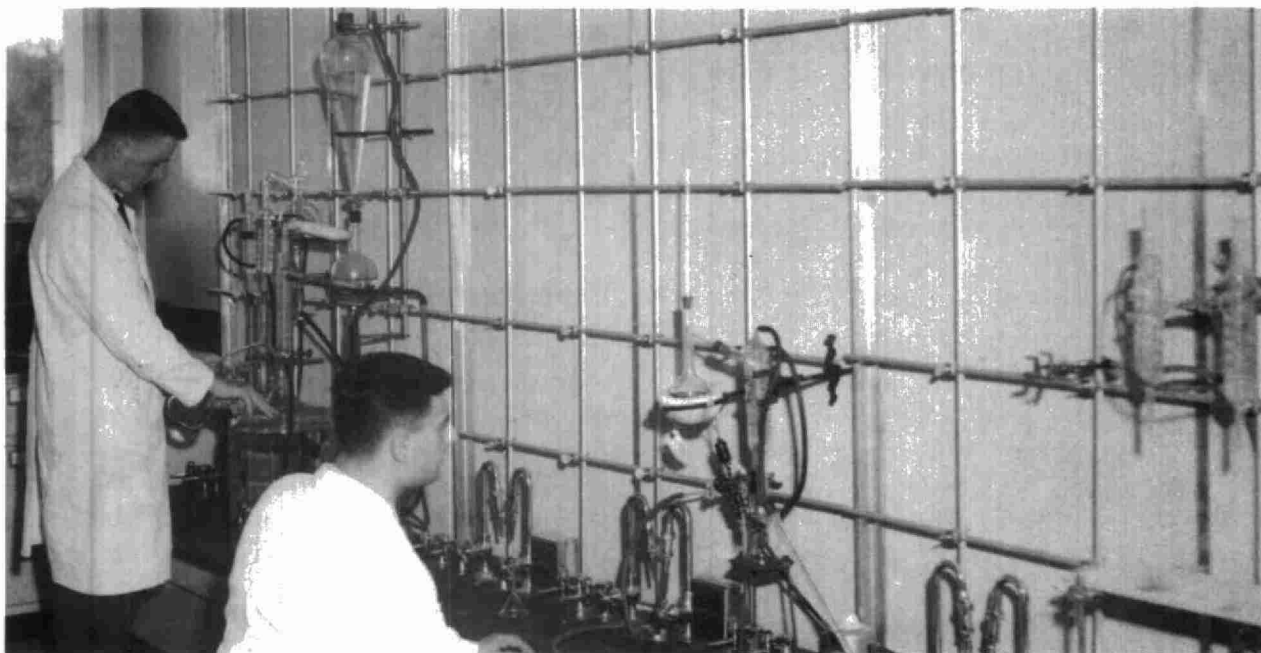
There was no increase in river sampling during the year.

Sampling by the Industrial Wastes Branch was concentrated in two major surveys through northern Ontario during July, giving a decrease in the branch's overall sampling of 19%.

Graph III - Output of Laboratory Sections: The pronounced peaks characteristic of the individual types of samples were averaged out to some extent by distributing individual tests on samples among the laboratory sections, so that each section shared proportionately in the overall load.

It should be noted that each of the sections experienced a fall peak in work which approached that of the summer.

Shortage of chemical laboratory staff was a distinctly limiting factor on the sampling activities of the OWRC during this fall period.



INDUSTRIAL WASTES BRANCH

The activities of the Industrial Wastes Branch continued to expand during 1962 in keeping with the growing emphasis on industrial wastes as sources of stream pollution and sewage treatment plant loading. Two hundred and seventy-six field investigations were made, ranging from surveys of combined discharges to municipal sewerage systems to investigations of individual sources of wastes from industries throughout the province.

Staff

The technical staff of the branch consisted of eight engineers, one chemist and one engineering technician. Field staff was augmented during the summer months by the employment of two engineering students and one student technician. As in the past, the effective work-force was reduced during the fall and winter by the granting of leave-of-absence to two engineers to take the post-graduate public health engineering course.

Municipal Sewage Treatment

Investigation of the discharge of industrial wastes to municipal sewerage systems continued to be an important undertaking. The treatment of many industrial wastes in municipal treatment plants was recognized as both necessary and desirable, and a major part of the field activity was devoted to surveys in advance of sewage treatment plant construction, to determine the characteristics and quantities of wastes to be so-treated. Space limitation in built-up urban areas ruled out the practicability of treating many industrial wastes separately, and there was often no reasonable alternative to accepting them in the municipal system. Waste control was then sought at the source, in the industrial process itself, and it was here that close liaison with industry proved beneficial. Surveys of wastes to be treated in proposed municipal treatment plants were made at Brockville, Chatham, Cornwall (in part), Midland and Timmins, and previous surveys were reviewed at Aurora, Barrie, Brampton, Brantford, Burlington (Drury Lane and Elizabeth Gardens plants), Cobourg, Galt, Hespeler, Lindsay, Paris, Preston, Uxbridge and Waterloo.

Contact with new industries was facilitated by close liaison with the Provincial Department of Labour, Engineering Services Branch, which relayed to the Industrial Wastes Branch information regarding proposed construction of industrial plants which were given Department of Labour approval.

In addition to field studies, work went forward on the preparation of a set of uniform criteria for the acceptance of industrial wastes into municipal sewers throughout the province. Suggested municipal by-laws, for both storm and sanitary sewer-use, were drafted in co-operation with the Commission solicitor, and were brought to the attention of the City Engineers Advisory Committee for preliminary review.

Northwestern Ontario

The industries of northwestern Ontario, which have been the subject of extensive surveys during recent years, were re-examined to evaluate changes in processes and waste handling methods which had been made. Ten pulp and paper mills, nine mines, three breweries, two dairies, two railroad tie plants, two chemical plants, one railroad roundhouse, one wood preserving plant, one oil refinery and one wheat starch plant were surveyed. Included in the pulp and paper mill surveys was a 32-hour continuous sampling of wastes from the Fort Frances mill of the Ontario and Minnesota Pulp and Paper Company, Limited, as part of the overall pollution survey of the Rainy River being undertaken by the International Joint Commission. Sampling at the other nine pulp and paper mills ranged from eight-hour to 24-hour composites. The continuing effort by the Commission throughout the area revealed marked improvement in waste disposal practices in most instances.

Northeastern Ontario

Investigation of industrial waste discharges in northeastern Ontario from North Bay to Kapuskasing was also fairly complete, with surveys at five pulp and paper mills, four mines, one chemical plant and one packinghouse. In addition to the initial study of four of the five pulp and paper mills, the review and approval of waste disposal proposals for a new iron ore development south of Kirkland Lake was noteworthy. Provision was made for the permanent impoundment of some 80,000,000 cubic feet of tailings per year, with water-use minimized to about 1,200 gallons per minute by an almost "closed" industrial system.

The St. Lawrence Seaway

The present and potential development of the St. Lawrence Seaway as a major industrial area received much attention, and a continuing study of existing and proposed sources of wastes was being made. The accessibility of ocean shipping and major

markets, and the ability of the river to supply almost limitless quantities of process water and then assimilate wastes were regarded as important factors in new plant location. Surveys throughout the area from Kingston to Cornwall were stepped up in keeping with the expected development.

Southwestern Ontario

The efforts of the Commission to adequately control pollution by the construction and operation of municipal treatment plants were effective in eliminating many individual sources of wastes that have been troublesome for many years, especially in the Grand River watershed. Some treatment plant operating problems have arisen and these are under study to seek control prior to discharge to the sewers.

The acceptance by the large industries at Sarnia of the responsibility for maintaining close control of all processing wastes has minimized pollution in that area. One or two accidental "spills" occurred during 1962, but, with these exceptions, waste treatment and control were effective.

Metropolitan Toronto - Hamilton Area

The intense industrial development along the shore of Lake Ontario was followed closely with the co-operation of personnel of the works department of the municipality of Metropolitan Toronto and other agencies. The Industrial Wastes Branch of the Commission continued its close liaison with oil refineries west of Toronto, and, as at Sarnia, waste control was found to be effective.

A study of the discharge of wastes to Hamilton Bay was begun and was to be completed by early spring, 1963.

General

The approach to problems on an industry-wide basis was continued in 1962, with special emphasis on the pulp and paper, mining, packinghouse, tanning, and brewing industries. Although the difficulties encountered in bringing representative groups together detracted from the effectiveness of this approach, a preliminary meeting with a liaison committee of the pulp and paper industry indicated a desirability on the part of industry to work with the Commission in this way. Summaries of information pertaining to packinghouse operations and brewing and distilling operations were in preparation to permit further action in 1963.

A review of 22 mining waste disposal areas in the past year indicated a general awareness throughout the industry for the need for continual surveillance on the part of industry. With few exceptions, tailings impoundments have been established and well-maintained. Increased water-use for municipal and recreational purposes indicated the need for additional control of soluble components of the waste, however, and further study of this aspect was proposed. No significant problems of radio-active contamination were indicated, although, again, the problem of the effects of other water-soluble components was to be studied.

In general, all industrial information obtained by the branch was recorded on data-sorting cards which were first prepared this year. Information on some 450 industries was recorded up to the end of the year, and the data from over 300 additional industries assembled for further compilation. Full use of the cards would permit prompt extraction of data by location (municipality, county or watershed) or by type of industry, and would provide a ready reference to either individual sources of water-use and waste disposal or the total loading for a particular municipality or defined area.

PURIFICATION PROCESSES BRANCH

The year 1962 found the branch engaged in a number of research projects and a great many investigations in the water and waste water field. The research projects included ion exchange, evaluation of mechanical aerators, and operation of an activated sludge pilot plant. The many investigations ranged from routine taste and odor tests at a number of municipal water works to the investigation of pollution of an irrigation pond at a golf course. Many new problems arose, while others were continuations of previous ones.

The branch assisted and co-operated with the Division of Plant Operations in alleviating problems at some of the Commission-operated water and sewage treatment plants. These joint ventures proved beneficial to both, and there was no doubt that more work of this type would be undertaken in the future. However, the increased studies would require more laboratory technicians to perform the routine work as more data was required in the tests. Much new equipment was obtained during the past year and properly trained personnel would be needed to operate these instruments.

The year 1962 saw the completion of the long-awaited pump-house for drawing water from the Humber River. River water was made available for experimental work involving water treatment processes, including:

- (1) evaluation of coagulant chemicals.
- (2) tests with a high-rate sand filter, used in swimming pool application. (The turbidity removal was not as effective as claimed by the manufacturer.)
- (3) pilot studies with a diatomite filter unit (to be undertaken in 1963).

Research Projects

Diatomite Filters

Early in 1962, the first diatomaceous earth water filtration plant in Ontario began to operate on a continuous basis at Marmora. During the early stages, there were some difficulties encountered in the operation of feeding equipment and the main filter pump. Some of the problems involved feeding proper dosages of activated carbon and filter-aid as body feed in order to achieve satisfactory color removal while maintaining good filter runs. The feeders were calibrated and proper feed rates of these chemicals were established. Most of the operating difficulties had been ironed out by the year-end. Towards the end of the year, this plant was operating satisfactorily, producing good quality water.

Pilot studies with a pressure-type diatomite filter were conducted at Southampton. The purpose of these studies was to determine the feasibility of this method of water treatment for the municipal supply. The municipality was supplied with water from Lake Huron where the turbidity was unusually low, except for a few days during the year when flash flood conditions occurred in the nearby Saugeen River. Preliminary tests indicated the diatomite filtration process could be the most practical method of treatment.

Aero-Accelator

The "Aero-Accelator" was operated for a short time in the fall of 1962, so the staff could become familiar with its use. Difficulties in operation were experienced due to sludge deposition in the bottom of the tank and it was necessary to dewater the plant in order to remove the sludge. Before it

was put into operation again, equipment was to be installed for the recording of pH, oxygen-reduction potential and the rate of oxygen utilization. This would permit data to be collected, that would be useful for further work on activated sludge.

Ion Exchange

Surface waters, especially those in the northern part of this province were soft and caused corrosion problems in the distribution systems. These conditions could be alleviated to a certain degree by addition of chemicals to raise the pH of the water. This method of treatment was not always satisfactory. It was suggested that the pH of the water could be raised by removing the acid radicals by the use of anion exchange resins. A laboratory scale ion exchange column was set up and tests were conducted using distilled water containing acids. The results obtained from these studies were encouraging and it was hoped that this study could be continued using pilot scale ion exchange columns on location where waters of this nature were available.

Mechanical Aerators

A three-foot diameter Simcar surface aerator was tested for its oxygenating capacity at varying aerator speeds and exposures. The power consumption at each test condition was measured also. The brake horsepower output at the aerator shaft was measured by means of a Prony brake. Efficiency of aeration could then be expressed in terms of pounds of oxygen per brake horsepower hour.

The observed efficiency of aeration varied between 4 and 6lb. O₂/BHP hr. All tests on the three-foot unit were carried out in an eight-foot square tank with three feet, six inches, water depth. In the same tank bottom, velocities were measured at varying aerator speed and immersion. Velocities varied between 0.5 and 1 fps.

Using the same experimental installation a series of experiments were carried out to study the effects, on the rate of oxygen absorption, of the accumulated sulphate concentration, the temperature of the water, and the catalyst concentration.

A full scale aerator (seven feet, six inches, in diameter) was installed in an aeration tank at the Georgetown sewage treatment plant, where it replaced one of the existing aerators. Oxygen absorption tests in de-aerated tapwater were carried out at two aerator speeds and three different immersions. A

disadvantage of the performance of these tests on full-scale tanks was the very large quantities of sodium sulphite required for de-oxygenating the water at the start of each test. Under average conditions 50 pounds of sulphite would be required for a single test.

Attempts were made to measure the brake horsepower output at the aerator shaft, but by the year-end no reliable data had been obtained. As a result, the performance of the aerator could not be compared with the three-foot unit in terms of lb. O₂/BHP hr. Bottom velocities were measured at the same two aerator speeds and one immersion.

A beginning was made on a series of rate of oxygen absorption measurements using the mixed liquor in the aeration system as a medium. For each test the rate of oxygen utilization by the activated sludge had to be measured, so that the total oxygen input could be determined. If these tests revealed reproducible results that compared favorably with the results obtained from tests using de-aerated tapwater, it might be proven possible to use the activated sludge procedure as a routine test for the measurement of oxygen absorption capacities of plant size aeration systems.

INVESTIGATIONS

Tillsonburg

An extensive investigation was carried out at the Tillsonburg Sewage Treatment Plant. The flow records at first indicated a hydraulically underloaded plant, but this was due to a faulty meter and further studies showed that the plant was running at hydraulic capacity. However, the flow into the plant was fairly constant around the clock and the high flows during the night were believed due to infiltration of the sewers by ground water. The major problem at this sewage plant was due to sludge bulking of the final clarifiers which resulted from a high sludge volume index in the mixed liquor. Low dissolved oxygen concentrations were also experienced in the aeration tanks.

It was felt that these problems were due to short-circuiting of the sewage in the aeration tank and tests were carried out to determine if this was actually the case. This sewage plant was equipped with spargers and had a very low length to width ratio (5:3), which might suggest short-circuiting. However, tests using fluoresceing and dissolved oxygen concentration profiles across the aeration tank failed to show any marked variations in dissolved oxygen and hence no proof of short-circuiting.

It was suspected that the sewage was short-circuiting around a central core of stable sludge in the aeration tank and this would not show up in the dissolved oxygen test. Further tests, using salt as a tracer, were indicated for 1963.

Another problem at this plant was the operation of the air compressors. It was impossible to operate both compressors at the same time for any length of time. It was felt that air piping and the number of spargers could be inadequate. If this was the case, increasing the number of spargers might help to maintain a consistently higher dissolved oxygen content in the aeration tank.

Lakeview & Northern Industrial Laundry

An investigation was made into the operational problems at the Lakeview Water Pollution Control Plant. The problems began when the sewer from Metropolitan Toronto was opened to the plant. Considerable industrial wastes were included with this sewage and scum formation in the aeration channels and the final clarifier decreased the plant efficiency. Infra-red analysis of the scum showed that it consisted primarily of a mixture of fatty acids and petroleum products. Since it was felt that the source of this waste was in the Metro sewer, further investigation indicated that the wastes were being discharged by Northern Industrial Laundries. Proof that this waste was the problem was shown in the almost identical infra-red spectrographs of the waste and the scum at the Lakeview plant.

It was also felt that the low dissolved oxygen concentrations were the result of poor oxygen transfer which in turn was due to the presence of the oil-laden laundry wastes.

These laundry wastes have always been a problem and means of treating these wastes were studied. It was found that before any physical method of treatment could be used, it was necessary to break-up the oil-detergent emulsion. This could be done by various means, but the simplest and most economical was the use of concentrated sulphuric acid. Air flotation could then be used to effectively remove the separated oils and solids down to a concentration permissible for discharge to the sanitary sewer.

Dunnville

The micro-strainer fabric at the Dunnville pumping station was found to contain many small pinholes and it was first believed

to be caused by excessive grit which had entered with the raw water due to a break in the intake. With this in mind, an extensive study was carried out to compare some of the characteristics of Lake Erie water at the Dunnville, Union and Bertie water plants. All three of these plants use micro-strainers. These tests commenced after the intake at Dunnville had been repaired. The study showed that the lake water in the area of Dunnville had a consistently higher filtrability index than either of the other two plants. The higher results at Dunnville were concluded to be due to the influence of the Grand River.

The pin-holing problem was presented to the Ontario Research Foundation and the Physical Metallurgy Branch of the Department of Mines (Ottawa), both of which made careful examinations of samples of affected fabric and their conclusion was that corrosion was the primary cause. Principals for the manufacturer, Glenfield and Kennedy (England), agreed to this conclusion of corrosion but differed as to the cause of corrosion. They felt that precipitation of calcium carbonate (which would result from unstable water conditions) on the fabric allowed the formation of electrolytic cells which then started the corrosion of the stainless steel fabric. A study by this branch on the stability of Lake Erie water and mixtures of Lake Erie water with Grand River water showed a stable water under most conditions and very slight scale-forming tendencies sometimes. Also, the investigation by the Ontario Research Foundation and the mines branch indicated a strong possibility that chloride ions may have influenced the corrosion. Stainless steel was known to be very susceptible to halogen corrosion. Strong chlorine compounds, used for periodic cleaning of the micro-strainers, were believed to be the source of the chlorides. While no definite conclusion was reached as to the specific cause of corrosion, tests were being conducted jointly by the company and the Commission to find a suitable, less corrosive, cleaning agent. In other words, there appeared to be some reluctance by the company to continue the use of sodium hypochlorite for cleaning of the fabric.

Sudbury

In October, the City of Sudbury was assisted with the setting up of a routine test procedure at the municipal water works for the determination of threshold taste and odor values throughout the year. On the basis of this information a decision could be made as to the type of treatment required in addition to chlorination, in order to control excessive taste and odor qualities of the raw water.

Kirkland Lake

In December samples from the Kirkland Lake water supply were received at the Laboratory for threshold odor analysis and for the determination of the most suitable method of controlling an extreme odor condition occurring in the water supply at that time. The cause appeared to be a change in the algal population in Gull Lake as a result of the lake turnover and of ice formation. Superchlorination was found to be the most effective method of control. Breakpoint chlorination was recommended as the only practical method considering the equipment available for treatment.

Ground Water Pollution, Acton

In 1961, the tannery in Acton purchased a farm in Esquesing Township for the purpose of extending its waste disposal program by means of spray irrigation. Some of the residents with wells in the vicinity of this spray area had expressed concern of possible pollution of their wells from saline material in the tannery wastes. A close check was kept on these wells. The tannery extended its operation on the farm and a greater volume of wastes was sprayed onto these fields. During the year marked increase in chloride levels was observed in two wells, one located on the farm, the other just across the road. The chlorides in these wells jumped from 20 ppm level to about 300 ppm.

Acceptance Tests at Paris

Personnel of the branch co-operated with the Division of Plant Operations in carrying out a series of tests at the newly built sewage treatment plant at Paris. The purpose of these tests was to determine the oxygen absorption capacity of the mechanical aeration system installed in the plant. The results of these tests were lower than capacity claimed by the manufacturer.

Parkhill

The Parkhill sulphide removal plant was inspected on a number of occasions in the past year. The sulphide content of the raw water increased to just over 50 parts per million with the aeration process reducing this to about 5 ppm. The problem lay in the fact that the storage reservoirs failed to reduce the sulphides to a level so that a minimum of chlorine need be used. Chlorination at this plant was primarily for removal of the small amount of residual sulphides rather than

for disinfection. However, if the sulphide content was still fairly high after treatment then more chlorine would be required and this resulted in an unstable condition in the finished water--also in "red water" complaints by the consumers. On the other hand, insufficient chlorination, while leaving the water stable, would result in residual sulphides going into the system.

The heavier rate of chlorination created another problem in the mains. This was the breakdown of the accumulated iron sulphide with the resultant formation of iron hydroxide and hydrogen sulphide. The build-up on the inside of the pipes occurred over a period of many years and ranged from 1/16 inch to 1/4 inch in thickness and even with stable water conditions, some problems would likely be encountered. Samples of the watermain were tested to determine methods of cleaning and the only means was the use of concentrated acid and this would be very impractical.

The use of sodium nitrate to maintain a dissolved oxygen content in the mains was being contemplated but a further problem might result due to the presence of nitrates which might act as nutrients for bacterial growth there. The use of potassium permanganate showed some promise as the addition of this chemical after aeration would help to oxidize the remaining sulphides and would also coagulate and help to settle any free sulphur present. There was the added problem of excessive sludge deposition and, remotely, of manganese staining.

Aurora

The branch was asked to determine whether polluted water was the cause of the bleached greens at the Aurora Highland Golf Club. The investigation which followed showed definitely that water which had been used to irrigate the affected greens was polluted by a chemical biocide known commercially as Telvar-W. This chemical, used as a soil sterilant and non-selective herbicide, contains an active ingredient which is called "Monuron". The source of the pollutant was an upstream resident who had used the chemical for weed and algae control in a dammed-off section of the stream which formed a pond on his property. This pond was used for recreational purposes. The overflow from this pond flowed into the golf course pond from which water was used to irrigate the greens. Some greens were so badly affected that complete replacement was necessary. It was recommended that future use of any chemicals by the guilty party for aquatic weed control be put before the Commission for approval (OWRC Act Section 28b).

Strathcona Paper Company

Coagulation studies were carried out at the Strathcona Paper Company to determine whether better efficiency could be obtained in the colloidal system. Numerous jar tests were carried out and no improvement could be made on the present use of alum and separan. The mill installed a new paper machine and this resulted in the use of less water. Flows through the colloidal decreased by about 25% and thus its efficiency improved. The spray irrigation was operated later in the year than in previous years as spraying continued into November. No changes were made in the lagoon system and no problems were anticipated in the river water conditions because the flow in the river was much greater early this winter than in the past.

Others

Several industries were also given assistance. Northern Pigment Company were helped in determining the best method to coagulate their waste. Bakelite Company were helped with a problem of phenol determination in their laboratory. Sedimentation tests were made on samples from gravel washing operations in Ambel and Oxford East Townships for the Oxford Sand and Gravel Company. A problem in chlorine determination was straightened out for the Johns-Manville Co.

Jars were conducted at Chelmsford, Dresden, Perth, and Ford Motor Company's Niagara Plant where color removal and flocculation difficulties were involved, and at a meat packing plant in Burlington to determine the practicability of chemicals in removing B.O.D. and solids in the waste effluent.

New Equipment

This branch of the OWRC has acquired the following new equipment during 1962. These should prove invaluable in future research projects and investigations.

Cathode Ray Polaragraph--used for detecting and measuring the metallic elements in solution. It is possible to measure the metals in quantities as low as 0.01 ppm and these determinations are specific, accurate and usually carried out quite rapidly.

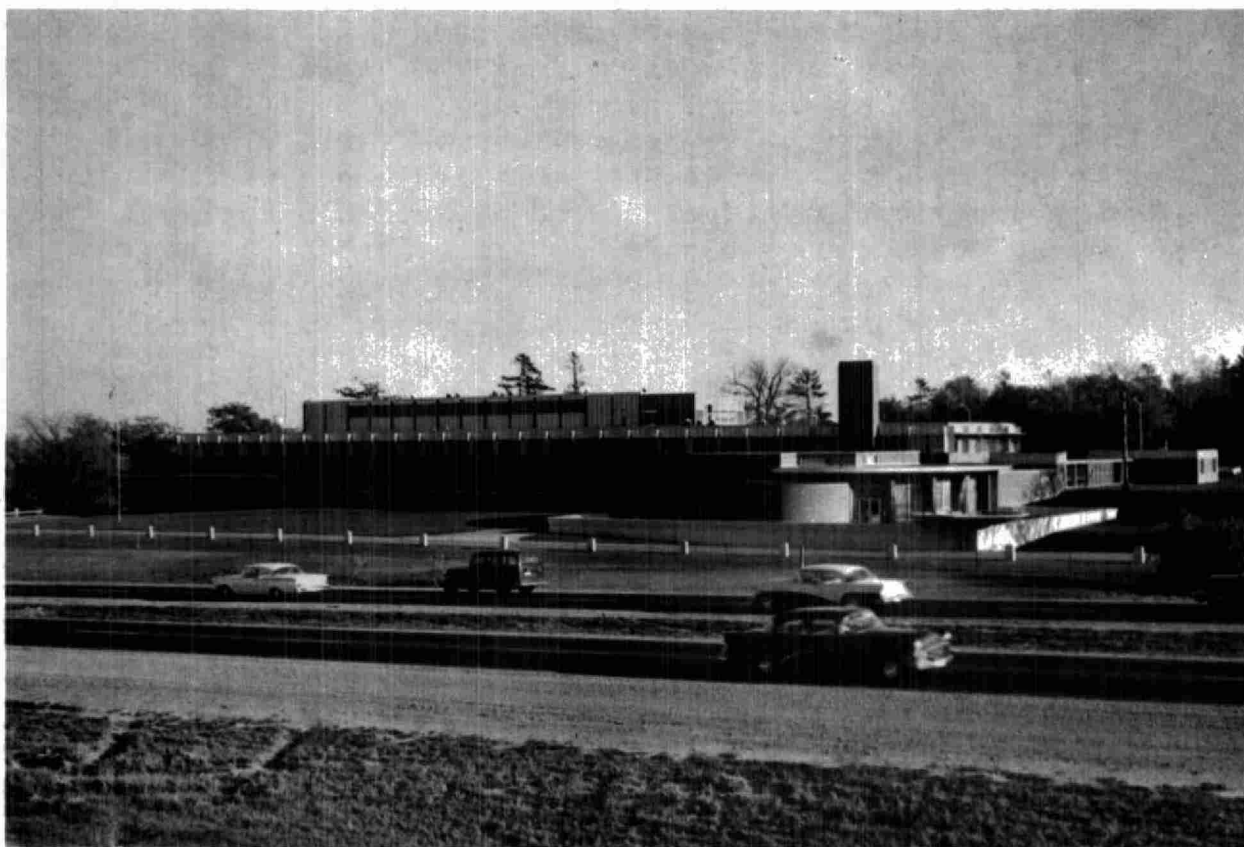
Dissolved Oxygen Meter--a recording turbidity meter for the research on diatomite filters.

Oxidation-Reduction Potential (ORP)--for ORP measurements. ORP has long been recognized as an important determination in the control of biological sewage treatment.

A Recording pH Meter--to be used in research or industrial waste and sewage treatment.

Analytical Work

In order to collect reliable data on research projects and on field investigations, this branch carries out its own analytical work. In 1962, there were 11,097 chemical determinations in the field and in the laboratory.



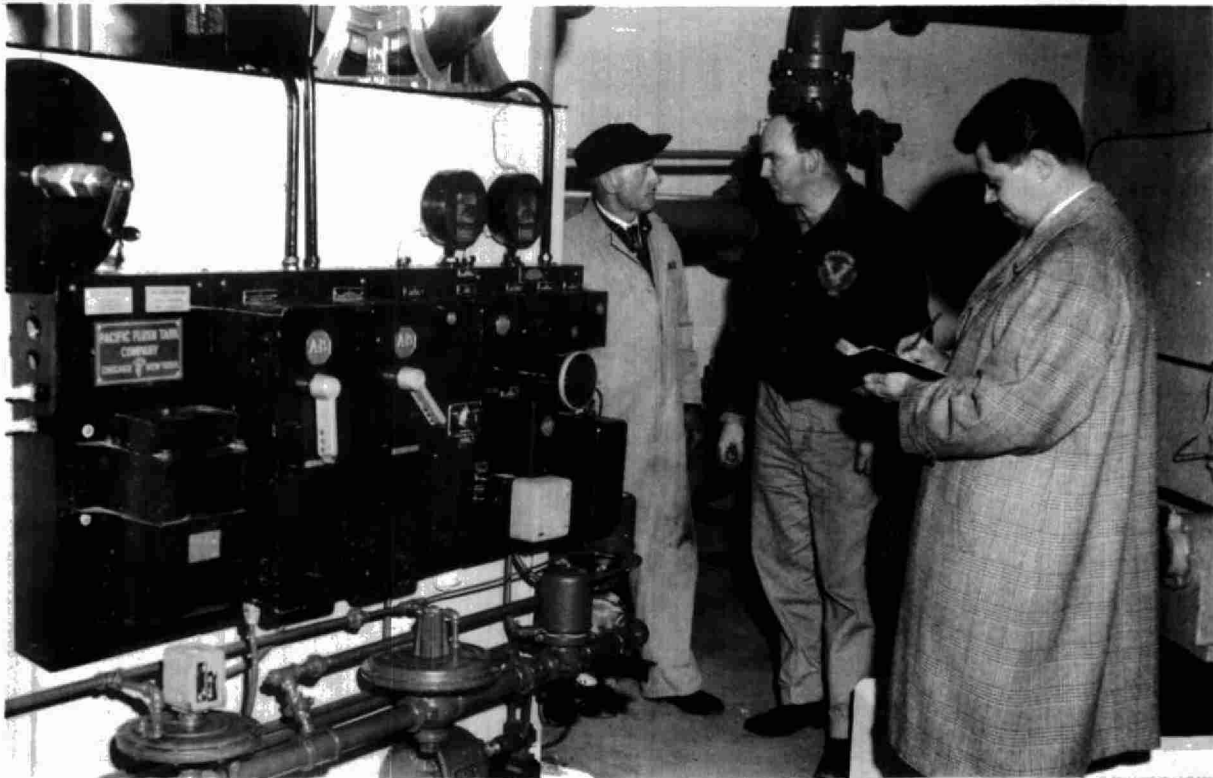
DIVISION of PLANT OPERATIONS

D. S. Caverly - Director

B. C. Palmer - Assistant Director

The division continued to expand, both in its responsibility for the operation of Commission-financed sewage and water projects, and in size of staff required to meet these responsibilities.

New projects put into operation during the year totalled 44, bringing the project-responsibility of the division to 155. The staff increased from 31 in 1961, to 41 at the end of 1962.



Divisional activities included supervision and operation of projects, maintenance of equipment and head office administration. Direction, supervision and control of project operation was carried out by the director, two supervisors, five project engineers and six assistant engineers. This

group assisted in plans review, design meetings, establishing operating procedures and staff hiring and training for new projects. They also maintained control over the operating processes, quality of product and economic balance. They initiated and maintained contact with Local Advisory Committees which co-operated in the administration of the projects.

Equipment and machinery maintenance was the responsibility of two head office groups, the Maintenance Section and the Technical Service Section. These sections, made up of nine engineering assistants under the direction of the Co-ordinator of Maintenance, functioned to establish preventive maintenance procedures, lubrication schedules and a program of regular inspections of all mechanical, electrical and electronic equipment in all OWRC-operated plants.

In addition, these groups rendered technical assistance during emergencies.

The office staff of the division comprised an engineer, a senior clerk, three engineering assistants, five clerks and five stenographers. Their main function was to give administrative support to the engineering and technical maintenance staff.

Assistance was given in the organization of official openings of projects, and training programs carried on for operators in the field. Wherever possible, student education programs were conducted in connection with official openings of projects.

The program and responsibility of the division may be better appreciated from the following statistics:

(A) Total capital cost of works in operation at December 31, 1962 -

Sewage Projects	\$42,011,784	
Water Projects	\$18,700,063	
		<u>\$60,711,847.</u>

Capital value of works that came into operation during 1962 -

Sewage Projects	\$11,922,156.88	
Water Projects	\$ 3,823,919.77	
		<u>\$15,746,076.65</u>

(B) Projects in Operation -

<u>Year</u>	<u>Water</u>	<u>Sewage</u>	<u>Total</u>	<u>Increase</u>
1958	9	6	15	-
1959	21	13	34	19
1960	32	33	65	31
1961	53	58	111	46
1962	74	81	155	44

(C) Total Operating Costs of Projects - 1962 -

Water	\$ 303,580.48
Sewage	<u>\$1,072,206.11</u>
Total	\$1,375,786.59

(D) Total Operators on OWRC Payroll -

1958	15
1959	22
1960	92
1961	145
1962 Water	33) 162 Operating
Sewage	129) 50 OWRC Projects



(E)

(1) Insurance Premiums on OWRC Projects at December 31, 1962 -

	<u>Boiler Premiums</u>	<u>All Risk Premiums</u>	<u>Total</u>
Sewage	\$2,105.39	\$26,935.07	\$29,040.46
Water	<u>255.75</u>	<u>12,800.59</u>	<u>13,056.34</u>
Total	<u>\$2,361.14</u>	<u>\$39,735.66</u>	<u>\$42,096.80</u>

(2) Total value of insurance policies on projects in operation -

	<u>Boiler</u>	<u>All Risk *</u>	<u>Total</u>
Sewage	\$5,800,000.00	\$17,430,955.00	\$23,230,955.00
Water	<u>2,800,000.00</u>	<u>8,819,270.00</u>	<u>11,619,270.00</u>
Total	<u>\$8,600,000.00</u>	<u>\$26,250,225.00</u>	<u>\$34,850,225.00</u>

* Does not give coverage to distribution systems.

(F) Total Volume of Sewage Treated in 1962 - 16,459,426,000 Gals.

Total Operating Costs for 1962 -

Sewage Projects \$1,072,206.11

Average Operating Cost per Million Gallons

Sewage - \$65.14.

Total Volume of Water Treated and/or Distributed in 1962 -
6,339,592,000 Gals.

Total Operating Costs for 1962 -

Water Projects \$ 303,580.48

Average Operating Cost per 1,000 Gallons

Water - 4.79 cents.

Note: Expenses paid for by municipalities directly not included
in above costs. These amounted to approximately 3% of
the above. —



Plant Openings

Arrangements were made with municipal officials to hold official openings in 18 municipalities. Descriptive brochures were prepared for these and programs of student education were conducted at eight municipalities.

The official openings were held at:

Aylmer (S)	Nepean Township (S)
Chelmsford (S)	New Hamburg (S)
Cookstown (W)	Parkhill (W)
Espanola (W & S)	Playfair Township (W & S)
Hastings (W)	Port Colborne (S)
Listowel (S)	Sault Ste. Marie (S)
Marmora (W)	Shelburne (W)
Mitchell (W & S)	Warren (W)
Neelon & Garson (S)	Watford-Wyoming-Plympton (W)

These brought to 50 the total number of openings held by the end of 1962. In addition, "Open House" was held at six plants during 1962, at--

Bertie Township (W), Espanola (W & S), Mitchell (W & S), Nepean Township (S), Parkhill (W), and Port Colborne (S).

Local Advisory Committees

These committees were formed at most projects to provide liaison between the OWRC and the municipalities, in the operation and administration of projects. Excellent co-operation was received from these committees, resulting in increased mutual understanding and smooth running operation of projects. These committees continued to serve a valuable function.

During the year 1962 there were 70 Local Advisory Committee meetings held.

Projects

At December 31, 1962, there were 155 projects in operation made up of 74 water and 81 sewage. The number of new projects which came into operation in 1962 was 44, made up of 21 water and 23 sewage as follows:

Water Projects

58-W-28	Cookstown	61-W-80	Geraldton
59-W-42	Mitchell	61-W-87	Bradford
59-W-52	Hastings	61-W-88	Widdifield
59-W-53	Brooklin	61-W-89	Rockland
60-W-67	Playfair Township	61-W-90	Petawawa
60-W-69	Goderich	61-W-92	Watford-Wyoming-Plympton
61-W-72	Espanola	61-W-94	Cumberland
61-W-73	Hanover	62-W-98	Bertie Township
61-W-74	Acton	62-W-99	Brantford
61-W-76	Brantford	62-W-101	Mersea
61-W-77	Brampton		

Sewage Projects

59-S-34	Paris	61-S-78	Toronto Township
60-S-50	Fort William	61-S-82	Toronto Township
60-S-56	New Hamburg	61-S-84	Belleville
60-S-63	Playfair Township	61-S-86	Newmarket
60-S-65	Neelon & Garson	61-S-87	Newmarket/East Gwillimbury
61-S-69	Owen Sound	61-S-89	Port Credit
61-S-70	Korah Township	61-S-92	Pickering
61-S-72	Shelburne	61-S-94	Aylmer
61-S-73	Port Colborne	61-S-95	Trenton
61-S-74	Espanola	61-S-97	Markham Township
61-S-75	Preston	61-S-99	Cumberland
61-S-77	Georgetown		

The 155 projects in operation served a total of 119 municipalities and four industries and could be broken down to show the following facilities provided:

Sewage Facilities

Primary Treatment Plants	9
Secondary Treatment Plants	21
Lagoons	13
Sewers	36
Total Oxidation	1
Trickling Filter	1

Water Facilities

Treatment Plants	15
Wells	28
Standpipes	11
Lake Intakes	8
Reservoirs	8
Mains only	12

Projects which came into operation during 1962 could be broken down as follows:

Sewage Facilities

Primary Plants	1
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Water Facilities

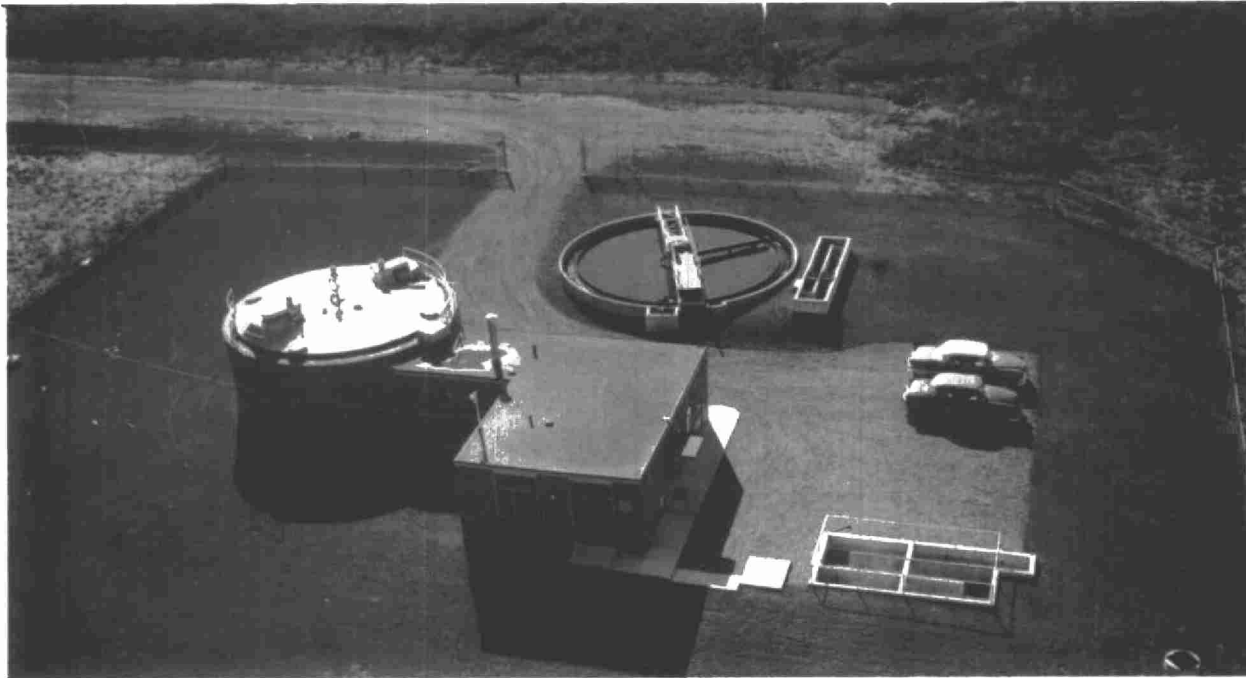
Treatment Plants	3
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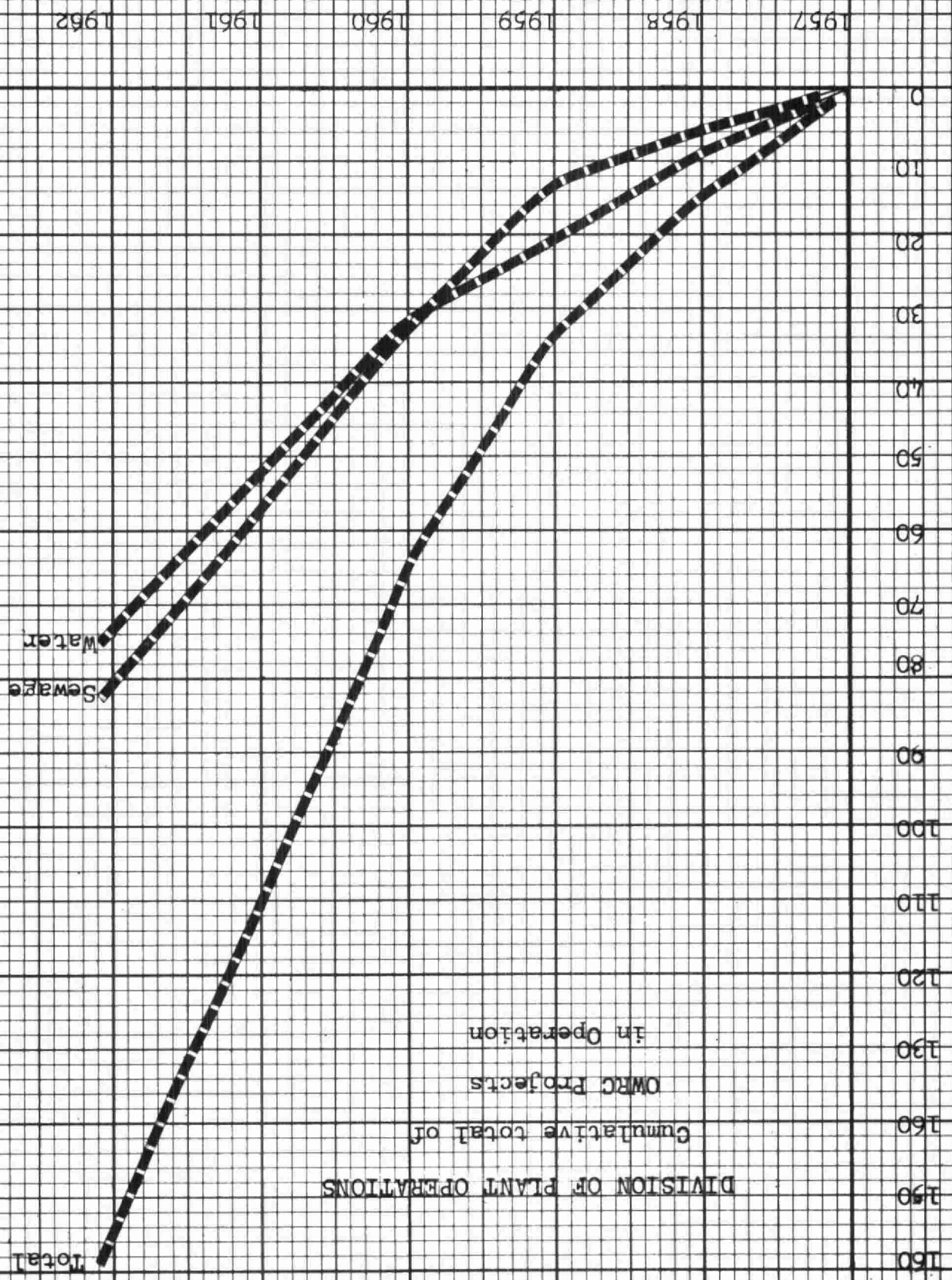
Sewage Facilities Cont'd.

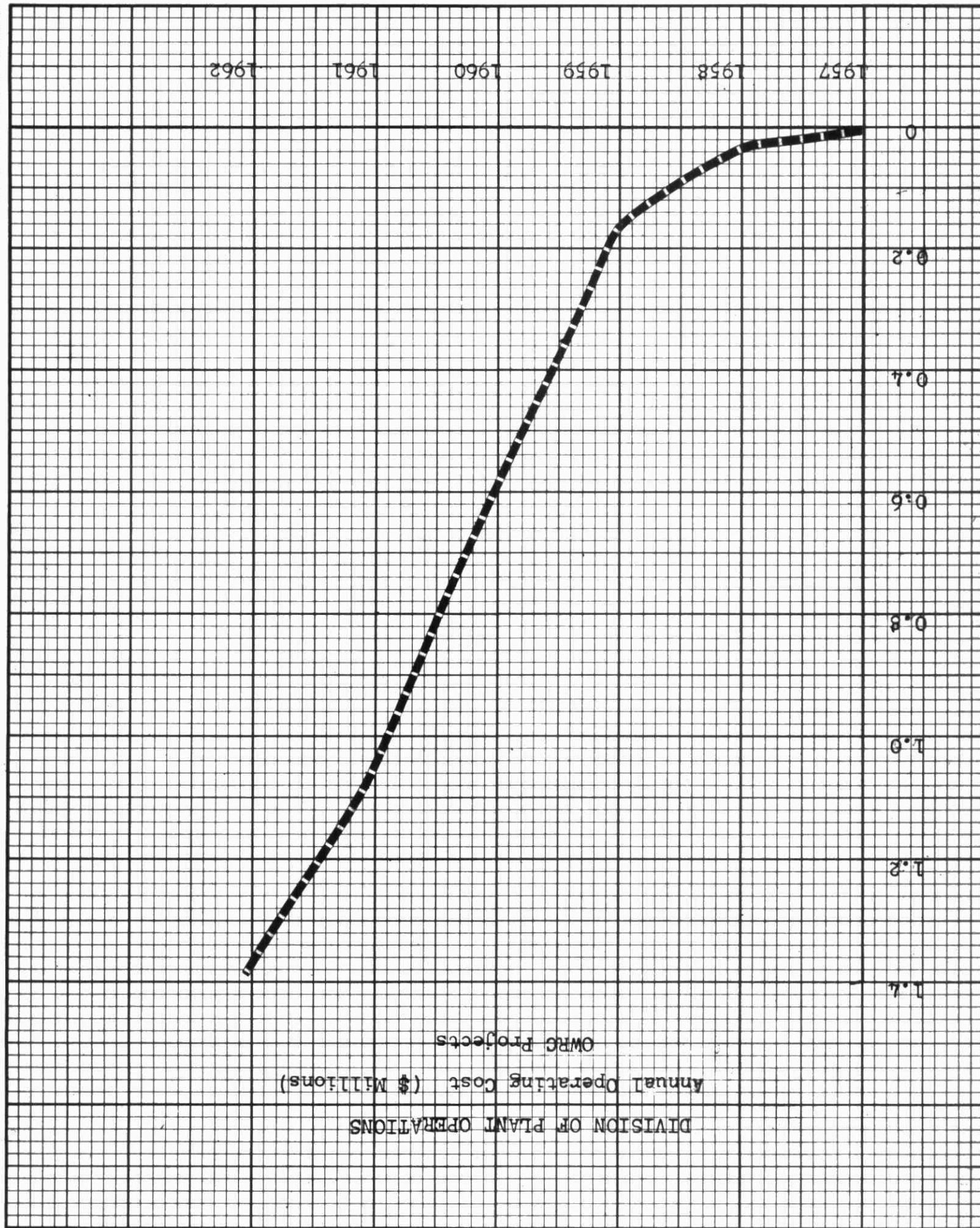
Secondary Plants	2
Lagoons	5
Sewers and Pumping Stations	15

Water Facilities Cont'd.

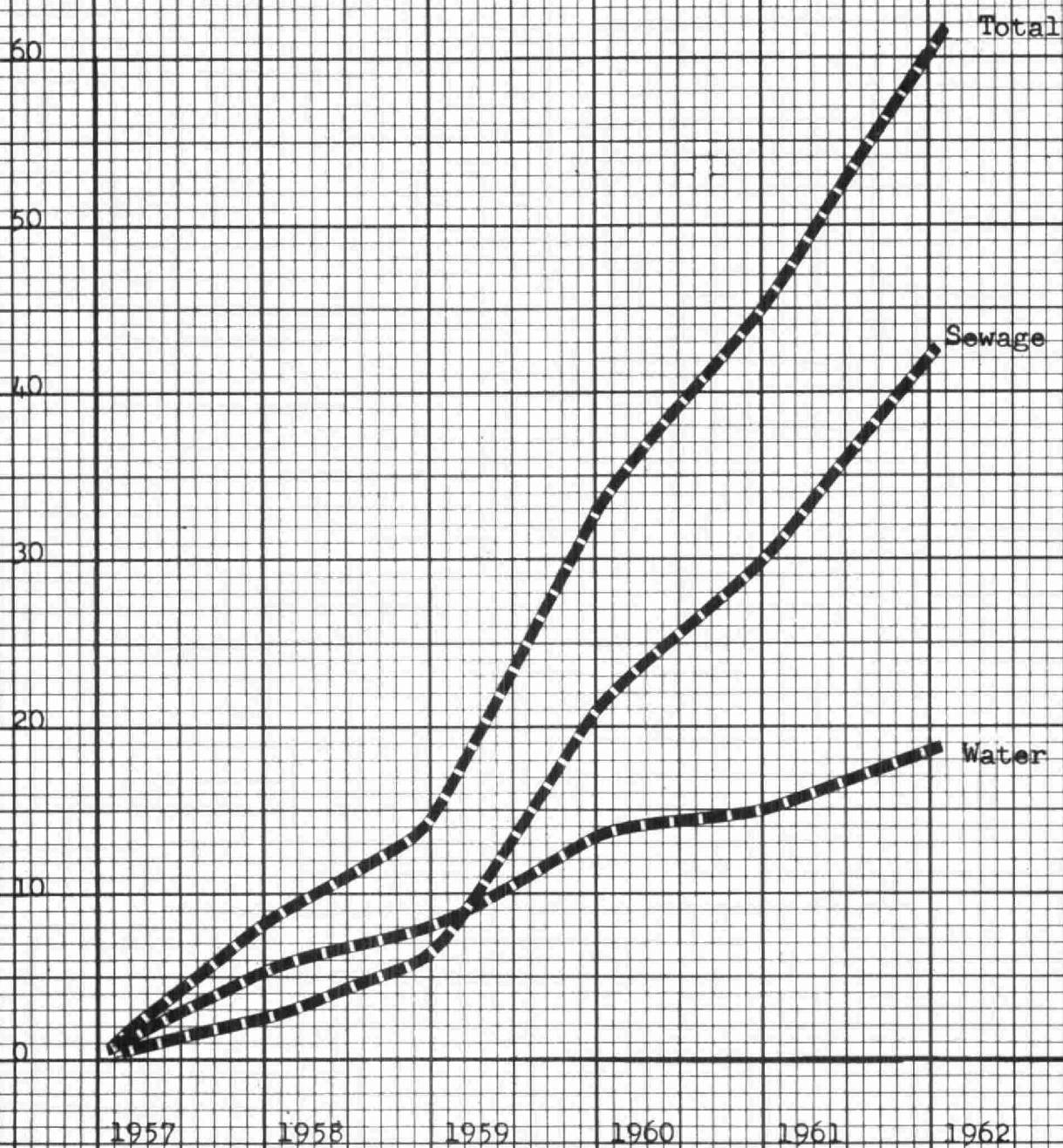
Wells	5
Standpipes	1
Lake Intakes	2
Reservoirs	2
Mains only	10

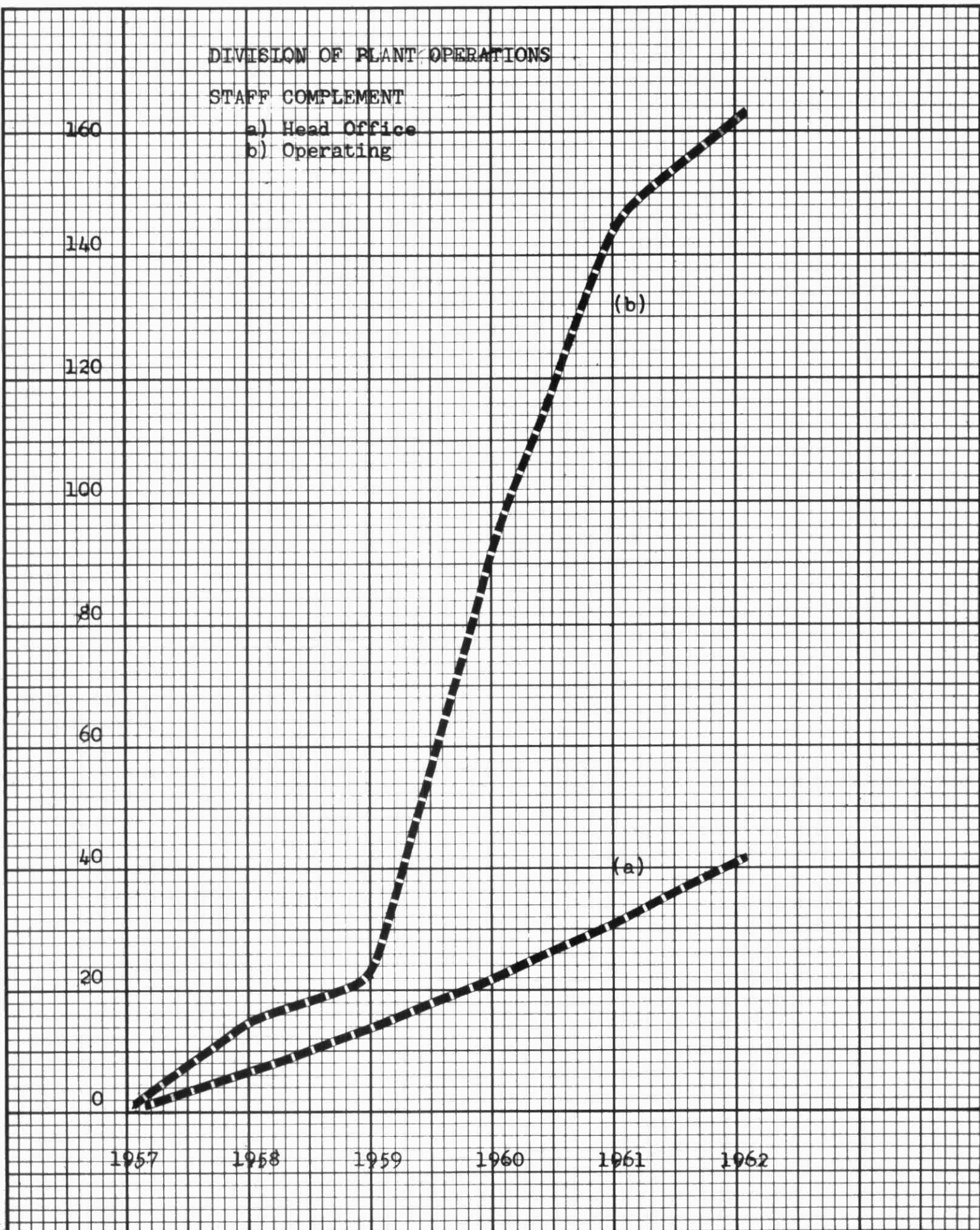






DIVISION OF PLANT OPERATIONS
Cumulative Capital Costs
of OWRC Projects
in Operation





DIVISION of SANITARY ENGINEERING

G. M. Galimbert, Director
K. H. Sharpe, Assistant Director

The activities of the Sanitary Engineering Division continued to be divided into three main phases, (1) the inspection and supervision of water supplies and sewage plants in the province; (2) the study and elimination of pollution from the waterways, and (3) the checking of plans of proposed water works and sewage works projects. In this work, the Sanitary Engineering Division co-operated not only with the other divisions of the Commission but with the Department of Municipal Affairs (Community Planning Branch) and the Ontario Department of Health (Environmental Sanitation Branch) in the review of sub-divisions and inspections in the field of water supply and sewage disposal which are closely allied to the work of the public health authorities.

Staff of Sanitary Engineering Division

There were 24 graduate engineers and 11 engineering assistants on the staff of the division at the end of 1962.

In January, 1962, the field staff consisted of nine engineers and nine engineer's assistants. As of December 31, 1962, the field staff was composed of 16 engineers and nine engineer's assistants. An additional three engineers were on a post-graduate course at the University of Waterloo as the year ended.

One graduate engineer supervised the stream sanitation program of the Commission and the work of the draughting room. In this work he correlated the information obtained and provided to him by the field staff in an effort to discover and record the sources of pollution to the waterways in the province.

District Engineering Work

The field work continued to be carried out under the supervision of four district engineers, each of whom covered a designated area in southern Ontario and another in northern Ontario. In this work, inspections were made in every part of Ontario. The routine work involved the regular inspections of water supplies and sewage disposal plants throughout the province, stream and pollution surveys and inspections of industrial waste discharges of canning factories, milk plants, gravel washing plants and abattoir.



Special investigations by the field staff were many and varied during the year. These were made at the request of municipalities or the general public. The district staff continued to follow-up information obtained from county water resources and pollution surveys previously carried out.

Water Works Inspections

There were 1,031 inspections of water treatment plants made by the district staff, compared with 815 for 1961. The total included 727 municipal plants, 71 industrial, 22 military, 38 institutional and 194 private inspections. The reports submitted indicated a high degree of proper operation and maintenance at practically all plants visited. Samples totalling 2,673 bacterial, 1,508 chemical and 79 other evaluations were obtained during the water works inspections. In 1961 totals were 1,855 bacterial, 1,205 chemical, and 44 other evaluations. During 1962, 72 per cent of the objective of three visits a year was reached, an improvement over the 54 per cent in 1961.

Waste Water Treatment Works

There were 1,248 inspections made during 1962 of waste water treatment works serving municipalities and industry, compared with 1,175 in 1961. There were a total of 961 bacterial, 2,137 chemical and 17 other samples obtained while making the inspections, compared with 720 bacterial, 1,928 chemical and 25 special samples in 1961.

The inspection objective of three visits a year for municipal sewage treatment plants, one inspection for septic tank facilities, and two inspections per year for industrial waste water treatment installations attained 60 per cent of the objective in 1962. Special investigations, many of which were time consuming, precluded the attainment of the set objective.

Stream and Pollution Surveys

There were 147 stream surveys made during 1962. In addition there were 105 municipal pollution surveys carried out. The stream and pollution surveys required the collection of 3,341 bacterial and 2,780 chemical samples. This compared with 2,109 bacterial and 2,506 chemical samples in 1961 and was an indication of the increase in work in this field. This phase of the Commission inspection work would increase when more staff was acquired as it was recognized as one of the primary endeavors of the organization.

Special Investigations

Special investigations requested by municipalities or the public continued to be a major factor in the program of the Sanitary Engineering Division. During 1962, there were 792 of these special investigations. Surveys of particular interest during



the year included supervision of the disinfection of the 16-mile Watford, Wyoming and Plympton pipe line which brought a much needed water supply to that area; the completion and distribution of a comprehensive report on pollution of Lake Ontario between Burlington and Scarborough; an investigation of a future water supply for the City of Owen Sound; the extensive sampling of the waters in the Muskoka Lakes; the evaluation of loading being directed to the large Listowel waste stabilization pond with special reference to the industrial waste being received; the investigation of adverse water samples on municipal systems in the Niagara Peninsula; the review of the Ottawa area in relation to present and future water and sewer needs and an investigation of the sewer outfalls in the City of Peterborough. Special investigations utilized approximately 30 per cent of the time of the field staff.

Stream Sanitation Branch

The Stream Sanitation Branch plays an important role in promoting the prime objectives of the Commission since the quality of surface waters predicate their availability and economic treatment potentiality for use as sources for municipal, industrial and private water supplies as well as other recreational and commercial uses. To ascertain the qualities of these waters and to indicate the sources of any polluting materials that may be degrading their qualities, extensive sampling investigations must be performed.

The results of the analyses of survey samples are received at the stream sanitation office. This information is transferred to the individual sampling point cards so it can be more readily available. During 1962 the results obtained from the analyses of samples obtained on 147 stream surveys and 105 municipal pollution surveys were thus recorded.

Stream sanitation work has involved an attempt to discover, catalogue and confirm sources of pollution in the major water-courses by a minimum of one complete stream survey per year on each, supplemented by partial stream surveys and municipal pollution surveys. In 1962, owing to the demands of the staff on other assignments, the maximum coverage obtained in stream surveys equalled only the minimum coverage objective in southern Ontario and was below this in the more remote areas of the province.

Draughting Room

The draughting room of the Commission forms part of the Stream Sanitation Branch, and one of its major activities is to prepare maps and graphs to accompany various reports for the various divisions of the Commission. In this work, 295 maps and graphs were prepared in the following categories: sanitary surveys, 108; projects, 33; watersheds, 7 and graphs and diagrams, 147. The staff of this section also assisted in the preparation of brochures for official openings and displays for the OWRC display at the Canadian National Exhibition. Sixty-four watershed tracings had been completed by the end of the year.

Cannery Waste Disposal

There were 139 inspections made of canneries during 1962, 85 per cent of the objective of two inspections per year of the 82 registered canneries. The number of canneries in operation decreased from 91 to 82 indicating a continued trend toward consolidation in that industry. Spray irrigation continued to be the most satisfactory type of treatment although, toward the end of the year, some consideration was being given to the employment of aerated lagoons in some installations.

Milk Plant Waste Disposal

During 1962, there were 225 inspections of treatment facilities serving milk plants. The usual treatment provided in this field was spray irrigation, although a few of the smaller plants continued to employ septic tank and tile field disposal with reasonable results. There was a continuance of the upward trend in the number of milk plants listed with satisfactory treatment.

Meat Process Plants Waste Disposal

During 1962, there were 76 inspections of waste water treatment facilities serving meat processing plants. At the end of the year, a new program of inspection was established for plants of this type and the 1963 inspection record, it was expected,

would be greatly increased. One of these plants located on a small stream in the Ayr area, at the year end confronted the Commission with one of its more difficult waste disposal problems.

Other Industrial Waste Plants

Forty-three miscellaneous waste water treatment facilities serving gravel washing plants and non-chemical industries were investigated in 1962. A high degree of co-operation was received from plants of this type.

Meetings With Municipal Officials

The district engineering staff continued to have more direct contact with water works' and sewage works' officials and personnel, throughout the province than any other group in the Commission. During 1962, there were 28 meetings with public utilities commissions and 47 with municipal councils. In addition, discussions were held with various municipal officials and were duly recorded. In this field, there were 276 discussions with municipal clerks, 150 with various other municipal officials, 341 with consulting engineers and 205 with health officials. This was an important aspect of the activities of the Division as it brought a direct contact between local officials and the Commission.

Water Works and Sewage Works Operators' Courses

Two schools for water works operators were held during the year. The first was a repeat of the intermediate course for water works operators and had 53 in attendance. The second was the first senior water works operators' course with 79 in attendance. At the conclusion of the latter course, the Commission issued certificates to those operators who successfully passed the examinations at all three courses.



There were two sewage works operators' courses held, the first an intermediate course with 108 in attendance, and the second, a repeat of that course with 36 in attendance. It was planned to hold the first of the senior courses in the sewage field in April, 1963. Certificates again were to be issued by the Commission to the successful candidates.

Review of Subdivisions

The Sanitary Engineering Division worked in close co-operation with the Department of Municipal Affairs (Community Planning Branch) in review of subdivisions submitted for approval. During 1962, 527 plans of subdivisions were submitted for review. On occasion, inspections on special problems were made in the field to assist in determining the course of action to be followed in reporting OWRC opinion of the water supply, sewage disposal and other features of the subdivision.

In addition, plans showing amendments to existing zoning in municipalities of Ontario also were submitted for review. During 1962, 42 area plans were reviewed.

Approval of Plans of Water and Sewage Projects

One of the major activities of the Sanitary Engineering Division was the review of plans for water and sewage projects for all municipalities in the province, including Commission sponsored projects. Review of the plans and specifications of such projects was made by the engineers of the Sanitary Engineering, Construction and Operations Divisions. Discussions also were held with consulting engineers and municipal engineers on major water works or sewage works projects being constructed independently of the Commission. During 1962, 704 certificates were issued for water works installations calling for an estimated expenditure of \$51,643,155.53. This can be compared with 641 certificates and an expenditure of \$28,931,973.56 in 1961.

In the sewage works field, 988 certificates were issued calling for an expenditure of \$96,111,221.28 in 1962. This can be compared with 962 certificates calling for an expenditure of \$78,085,088.86 in 1961.

Total Expenditure in Water and Sewage Fields

The total expenditure, estimated for the province during 1962 based on 1,692 applications submitted to the Commission for approval was \$147,754,376.81. This was an all-time high and a marked increase over the 1961 total of 1,603 applications and \$107,027,062.42. The previous high total was reached in 1954 when 1,208 applications called for an expenditure of \$125,999,578.05. Sewage works comprised 65 per cent of the total. This was a reduction from the 73 per cent reported in both 1961 and 1962.

The plan checking division had a banner year, partially due to the number of sewage plants built with and from the federal

financing program. It was gratifying to note that the federal program of assistance was to be continued for at least two years past the original March 31, 1963, deadline. While there was a short lag at the year-end in proposals for sewage projects, it was expected that the sewage plant building boom would extend through 1963.

The checking of plans for water and sewage works projects in Ontario provided the 1962 summary below, followed by an itemized list of certificates issued for each municipality for water works and sewage works for the year.

S U M M A R Y

<u>Re: Water Works</u>	<u>Estimated Cost</u>
Extensions to Existing Systems.....	\$25,221,559.03
Supply and Purification.....	\$25,184,177.50
New Systems.....	\$ 1,237,419.00
Total	\$51,643,155.53

<u>Re: Sewage Works</u>	<u>Estimated Cost</u>
Extensions to Existing Systems.....	\$66,493,593.54
Treatment and Disposal Works.....	\$25,689,557.76
New Systems.....	\$ 3,928,069.98
Total	\$96,111,221.28

The total number of applications favorably reported upon re water works and sewage works for the year 1962 was 1,692 and involves an expenditure of \$147,754,376.81. Of this total, OWRC projects totalled 185 with an estimated expenditure of \$27,436,297.98 or 18.6 per cent of the total.

CERTIFICATES ISSUED RE WATER WORKS FOR THE YEAR 1962

<u>MUNICIPALITY</u>	<u>No. of Certi- ficates</u>	<u>Extensions to Existing Systems</u>	<u>Supply and Purification</u>	<u>New Systems</u>
x-Acton	1	164,086.91		
Ajax	1	1,332.00		
Alfred	1	1,102.00		
Alliston	1	21,050.00		
Almonte	1	7,165.00		
Amherstburg	1	4,019.00		
Ancaster Twp.	1	27,352.00		
Ashfield Twp.	1			
(K-Right Development Co.Ltd., Port Credit)			4,720.00	

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New Systems
Atikokan Twp.	1		15,690.00	
Aurora	1	50,000.00		
Aylmer	2	792.00	25,000.00	
Balmertown I.D.	1	16,900.00		
Barrie	8	89,405.87		
<u>Barrie</u> (Garrett Development Limited).....	1	7,099.00		
Beaverton	1	683.80		
x-Beaverton	2	33,500.00	46,500.00	
Beeton	1	4,500.00		
x-Belle River	1	86,975.00	73,450.00	
Belleville	4	64,865.04		
<u>Belleville</u> (Mr. M. Rollins)...	1	4,341.53		
(Mr. J. Parrott)...	1	14,374.44		
(Mr. Chas. Lambert)...	1	15,114.47		
(Mr. D.J. Schatz)...	1	22,299.99		
(Mr. L. Denille)...	1	8,307.78		
Belmont	1	2,171.70		
Bertie Twp.	8	184,889.63		
x-Bertie Twp.	2	65,485.00		
<u>Billings Twp.</u> (Hydro & Development, Kagawong).....	1		1,420.50	
Blenheim	1	8,665.00		
Bowmanville	1	3,500.00		
x-Bradford	1	126,000.00	11,000.00	
<u>Bradford</u> (Luxury Home Builders Limited).....	1	10,020.00		
<u>Brampton</u> (Wingold Realty Ltd., Toronto).....	1	25,814.50		
(Peel Village Develop- ment Ltd.).....	2	85,125.00		
Brantford	3	171,573.09		
Brantford	1	205,500.00		
Brantford Twp.	1	5,500.00		
x-Brantford Twp.	2	129,100.00		
Brockville	1	7,800.00		
Burks Falls	1	25,000.00		
Burlington	6	86,373.36		
Calvert Twp.	1	8,235.00		
<u>Calvert Twp.</u> (Messrs. St. Denis & Hurtubise).....	1	6,766.00		
Campbellford	1		190,000.00	

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New Systems
Capreol	1	4,088.70		
Carleton Place	1		6,503.00	
x-Chalk River	1	128,335.00		
Chapleau Twp.	1	3,791.00		
Charlotteville Twp. (Mr. Herbert Lipsit)	1		2,735.00	
Chatham	6	44,135.00		
Chelmsford	2	11,720.00		
Chesterville	1	1,838.00		
Chinguacousy Twp.	4	133,000.00		
Clarence Twp.	1	9,056.50		
Clinton Twp. (Vineland)	2		11,300.00	
x-Cookstown	3			159,419.00
Creemore	1	5,000.00	10,000.00	
x-Cumberland Twp.	3	133,425.00	6,000.00	
Cornwall	5	58,473.95		
Delhi	2	19,149.92		
Dundas	5	26,190.90		
Dundas (Mr. Harold J. Yates)	1	4,050.00		
Dunnville	1	5,500.00		
Durham	1	3,043.31		
Eganville	1			104,724.00
Elmira	2	7,565.45		
Elmira (Elmira Land Develop- ment Ltd., Kitchener)	2	17,394.00		
(Mr. Norman Weigel) ..	1	1,200.00		
Elora	1	4,190.13		
x-Emo Twp.	2			144,000.00
x-Englehart	2	4,435.00		
x-Espanola	1	9,850.00		
Essa Twp. (Mr. A. Kordyback, King)	1	22,260.00		
Etobicoke Twp.	45	1,009,239.38		
Exeter	3	20,796.13		
Falconbridge Twp. (Falconbridge Nickel Mines Limited)	1	73,500.00	76,405.00	
Fenelon Twp. (Beehive Developments Ltd., Peterborough)	1		55,117.00	
Ferris West Twp. (Ralphway Construction Co. Ltd., North Bay) ..	1	16,427.18		
(Ferris Park Development Ltd., North Bay)	1	33,123.74		

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New Systems
Forest Hill Village	1	6,600.00		
Fort Erie	3	23,090.00		
x-Fort Erie	1	24,000.00		
Fort Frances	3	19,360.87		
Fort William	1		19,186.11	
Galt	3	69,960.50		
<u>Georgetown</u> (Georgetown Developments Ltd.).....	1	71,109.83		
Gloucester Twp.	5	190,334.92		
Gosfield South Twp...	1	3,480.00		
Gravenhurst	1	8,554.59		
<u>Grimsby</u> (Mitchell General Contractors, Hamilton)	1	8,924.00		
Grimsby North Twp. (Mrs. George Lawrence)	1	8,548.64		
x-Grimsby South Twp. (P.V. of Smithville)		16,000.00		
Guelph	2	695,000.00		
Gwillimbury East Twp.	2	12,060.00		
<u>Gwillimbury North Twp.</u> (Clark Construction Co., Keswick).....	1	3,723.00		
Hamilton	30	623,837.00	40,000.00	
Hanover	2	64,500.00		
x-Harrow	1	107,295.00		
x-Hastings	4	13,331.25		
Hawkesbury	3	14,891.00		
Hespeler	1	11,500.00		
<u>Hullett Twp.</u> (Manchester Water Committee, Auburn)	1		2,400.00	
Ingersoll	1	21,076.00		
Kemptville	2	3,000.00	1,200.00	
<u>Kendrey Twp.</u> (Trans Canada Pipe Lines Ltd., Toronto)	1		12,000.00	
Kenora	2	171,000.00		
King Twp.	1	72,700.00		
Kingston	10	539,562.43		
Kingston Twp.	1	6,223.84		
Kingsville	2	97,000.00		
Kitchener	3	354,122.00		
<u>Kohler Twp. (unorganized)</u> (Trans Canada Pipe Lines Ltd., Toronto)	1		12,000.00	

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New Systems
Korah Twp.	4	145,205.15		
Korah Twp. (Cabod-Canadian Ltd., Toronto).....	1	84,599.75		
Leamington	1	5,142.00		
Lindsay	3	44,407.64		
Listowel	3	40,801.20		
London	3	1,102,360.33		
London (Upper Thames Develop- ment Ltd.).....	1	1,650.00		
(Mountsfield Develop- ment Limited).....	1	19,400.00		
(Sifton Construction Limited).....	1	111,241.48		
(Eadie & Willock Limited).....	1	6,100.00		
(Scarlett Construction Limited).....	1	12,450.00		
(Mr. W.R. Kernohan)..	1	43,663.45		
(Southwinds Develop- ment Limited).....	1	25,313.00		
(Sunrise Development Limited).....	2	39,924.55		
London Twp.	1	16,245.76		
Long Branch	1	20,700.00		
Longlac I.D.	1	1,185.00		
Louth Twp.	1	33,420.00		
x-Louth Twp. (Jordan Station).....	1	202,327.00		
Lucknow	1	7,500.00		
Malden Twp.....	1	7,965.00		
Marathon I.D.....	1	31,995.00		
Markham	2	38,813.60		
Markham (Northgate Developments, Richmond Hill).....	1	9,372.00		
(Cotswald Estates Ltd., Willowdale).....	1	29,859.00		
x-Markham Twp.	4	237,009.24		
Markham Twp. (Wycliffe Homes Ltd., Downsview).....	1	25,320.67		
Marmora	1	4,134.00		
Mattawa	1	9,523.00		
Mersea Twp.	4	90,133.00		
x-Mersea Twp.	1	41,728.00		

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New Systems
<u>Metcalfe Twp.</u>				
(John & Amelia Melchior, London).....	1	4,052.00		
Midland	2	13,817.50		
Milton	1	6,631.75		
Mimico	2	70,500.00		
<u>Monck Twp.</u>				
(Mr. H.W.R. Oaten, Bracebridge)	1	10,000.00		
<u>Moore Twp. (P. V. of Brigden).....</u>	1		76,635.11	
Mount Forest	2	9,000.00	9,280.00	
Muskoka Twp.	1	7,947.00		
x-McDougall Twp.	1		7192,950.00	
x-Nakina I.D.	1	797,790.00		
Neelon & Garson Twps.	2	26,620.00	32,500.00	
x-Neelon & Garson Twps.	1	7112,000.00		
<u>Neelon & Garson Twps.</u>				
(Mr. E.C. Racicot)..	1	10,886.70		
<u>Nepean Twp.</u>				
(Minto Construc.Co. Ltd.,Ottawa).....	2	263,704.93		
(Merivale Develop- ments Ltd.,Ottawa).	1	320,450.00		
(Mr. Alvin Stewart, City View).....	1	13,400.00		
(T.F.S. Realty Co.Ltd., Ottawa).....	1	47,658.00		
(Campeau Construction Co.Ltd.,Ottawa)....	1	52,825.86		
x-Newcastle	1	2,618.00		
<u>Newcastle</u>				
(Strathben Investments Ltd.)	1	17,600.00		
x-Markham Twp.	1	7177,885.00		
New Liskeard	1	7,000.00		
Newmarket	4	40,197.00	40,000.00	
Niagara Twp.	1		33,600.00	
Nipigon Twp.	1		106,000.00	
North Bay	1	2,961.60		
<u>North Bay</u>				
(Mr. Stanley Cerisano)	1	13,250.44		
Oakville	7	64,040.59	179,736.46	
<u>Ops Twp.</u>				
(Permanent Investment Corp.Ltd.,Toronto)..	1		80,824.81	

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New Systems
Orangeville	2	7,985.00		
Orient Bay				
(Trans Canada Pipe Lines Ltd., Toronto) ..	1			9,000.00
Orillia	2	37,904.31		
Orillia Twp.	4	35,112.85		
Oshawa	12	303,911.55		
Ottawa	28	1,377,959.00		
Owen Sound	2	13,787.41		
Palmerston	1	24,400.00		
x-Parkhill	1	3,991.31		
Parry Sound	3	24,850.00	4,000.00	
Pembroke	4	37,314.25		
Penetanguishene	1	1,200.00		
Perth	3	87,300.00	2,809.00	
Peterborough	4	80,644.00	5,040.00	
Pickering Twp.	1	1,749.00		
Pickering Twp.				
(Resources Land Co- operative Corp., Toronto)	2	374,551.31		
Pittsburgh Twp.	2		33,000.00	
Plantagenet South Twp.				
(St. Isidore Water Works Syndicate)	1	8,252.09		
x-Point Edward	1		7309,000.00	
Port Arthur	1	101,583.00		
Port Arthur				
(Forest Park Develop- ment Limited)	1	43,513.00		
(Headway Builders Limited)	1	4,846.00		
Port Colborne	4	41,578.01		
Port McNicoll	1	1,225.00		
Preston	2	9,290.00		
x-Rayside Twp.	1			7275,000.00
x-Richmond Hill	1		7120,000.00	
Ridgetown	2	1,000.00	9,757.00	
Rochester Twp. (St. Joachim)	1			113,100.00
x-Rockland	1	112,000.00		
St. Catharines	3	154,823.50		
St. Clair	1	12,841.00		
St. Marys	1	3,500.00		
St. Thomas	6	69,568.00	1,000.00	

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New Systems	
x-Saltfleet Twp.	1	366,000.00			
x-Saltfleet Twp.	1	463,223.06			
Sandwich East Twp.	2	51,007.73			
Sandwich West Twp.	6	129,831.00			
Sarnia	5	315,000.00			
Sarnia Twp.					
(Moore Twp. Develop- ments Ltd.).....	1	4,350.00			
Sault Ste. Marie	4	214,249.16			
x-Sault Ste. Marie	3	1,168,985.00			
Sault Ste. Marie					
(Hollingsworth Invest- ments Ltd.).....	1	5,244.00			
(Mr. W.A. Rodman)....	1	55,045.00			
Scarborough Twp.	22	612,567.94			
Simcoe					
(Mr. Robert W. Laidlaw)	1	5,508.44			
(Gibson & Beckett Con- struction Co.).....	1	12,000.00			
Smiths Falls	1	62,872.00			
x-Southampton	1		4258,000.00		
Stamford Twp.	6	82,479.92			
Stirling	1	2,604.00			
Stoney Creek	1	750.00			
Stoney Creek					
(Malcolm Construction Limited).....	1	9,211.00			
Stratford	2	49,357.00			
Streetsville	1		2,183.00		
Sturgeon Falls	2	7,681.54			
Sudbury	5	80,188.50			
Sudbury					
(Beaumont Development Limited).....	1	9,046.40			
(Trend Realty Company)	1	1,804.00			
(Engineering & Devel- opment Limited).....	1	13,800.00			
(Barco Developments Limited).....	1	22,644.00			
(Mr. Ludger Michel).. <td><td>1</td><td>6,779.00</td><td></td><td></td></td>	<td>1</td> <td>6,779.00</td> <td></td> <td></td>	1	6,779.00		
(Sodi Land Limited).. <td><td>2</td><td>33,741.10</td><td></td><td></td></td>	<td>2</td> <td>33,741.10</td> <td></td> <td></td>	2	33,741.10		
(Destor Investments Limited).....	2	32,249.00			
Tarentorus Twp.	2	14,620.08			
Tay Twp.					
(Portage Park Estates Ltd., Midland).....	1		13,232.00		

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New System
Teck Twp.	1	19,595.00		
Thorold Twp.	4	13,152.80		
Tilbury	6	34,329.20		
Tilbury North Twp.	1	8,769.00		
<u>Tilbury</u>				
(Essex-Kent Amusements)	1	3,481.00		
x-Tillsonburg	1	250,000.00		
Tisdale Twp.	1	12,258.00		
Tiverton	1		4,000.00	
Toronto	2	110,150.00		
Toronto Metro	7	4,380,000.00	23,500,000.00	
Toronto Twp.	25	555,745.79		
Toronto Twp.	1	250,000.00		
x-Toronto Twp.	3	224,000.00	405,000.00	
<u>Toronto Twp.</u>				
(Applewood Developments Limited).....	1	50,307.34		
(Dixie Construction Ltd., Cooksville)....	1	11,044.25		
(Lakeshore Investment Corp. Limited).....	1	18,039.85		
Tottenham	1	6,425.00		
<u>Tottenham</u>				
(Mr. Clifford Abrams)	1	6,070.00		
Trenton	2	6,770.83		
Tweed	2	6,552.00		
<u>Upsala Twp.</u>				
(Trans Canada Pipe Lines Ltd., Toronto).....	1		12,000.00	
x-Vankleek Hill.....	1			210,000.00
Vaughan Twp.	5	222,200.00	115,500.00	
Walkerton	1	69,000.00		
Wallaceburg	3	19,365.00		
Waterloo	6	113,700.00		
<u>Waterloo Twp.</u>				
(Mr. Elmer Brandon, Breslau).....	1	2,612.00		
(Mr. Wm. J. Oliver)...	1	17,070.89		
(Chalon Estates In- corporated)	1		11,205.65	
Watford	1	7,240.00		
x-Watford	1	12,090.00		
x-Watford, Wyoming and Plympton Twp.	1			359,880.00
Welland	4	408,033.42		
x-Wellington	2			276,820.00

WATER WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Supply and Purification	New System
Westminster Twp.	1	41,570.00		
Wheatley	1	4,269.00		
Whitby	3	35,580.20	3,200.00	
Whitby Twp.	1	8,685.00		
Whitby East Twp.				
(Sun Valley Home Builders Co-operative Ltd., Oshawa).....	1		7,469.20	
x-Whitchurch Twp.	1	110,000.00		
Widdifield Twp.	1	5,542.00		
Widdifield Twp.				
(Central Mortgage & Housing Corporation, North Bay).....	1	73,852.00		
Wilmot Twp.				
(Mr. Clarence Schwart- zentruber, St. Agatha).	1		8,103.00	
Winchester				
(Mr. H.S. Lannin)....	1	5,550.00		
Windsor	2	95,616.00	9,310.77	
Woodbridge	1	7,220.00		
Woodstock	3	189,125.00	105,800.00	
Woodstock				
(Bernard-Hoffman Ltd., London).....	1	39,060.00		
(Huron Park Develop- ments Limited).....	1	16,600.00		
x-Wyoming	1			118,200.00
Yarmouth Twp.	1	8,900.00		
York Twp.	4	122,280.00		
York East Twp.	1	19,500.00		
York North Twp.	33	2,103,777.60		
Zealand Twp. (unorganized)				
(Trans Canada Pipe Lines Ltd., Toronto)...	1		8,000.00	
Zurich	1		13,200.00	
TOTALS	704	\$25,221,559.03	\$25,184,177.50	\$1,237,419.00

x- OWRC project

/ preliminary approval only - included in total number of certificates
not included in total estimates

CERTIFICATES ISSUED RE SEWAGE WORKS FOR THE YEAR 1962

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
Albion Twp. (University of Toronto).....	1		5,000.00	
x-Alexandria	2	106,000.00	72,000.00	
Almonte	3	18,715.00		
x-Almonte	2	136,000.00	88,000.00	
Amherstburg	1	4,244.00		
x-Amherstburg, Anderdon & Malden.....	1		786,346.00	
x-Arthur	1			158,500.00
Arthur	1	33,607.08		
Aylmer	1	13,609.00		
x-Aylmer	2	361,409.20	144,226.00	
Balmertown I.D.	1	9,900.00		
Bancroft	1	19,800.00		
Barrie	8	998,142.32	1,020,000.00	
Barrie (Castle Properties Ltd.)	1	5,502.00		
(Garrett Developments Ltd.).....	1	7,522.00		
Belleville	10	888,985.56		
x-Belleville	3	369,244.00		
Belleville (Mr. C.M. McLean)	1	17,605.00		
(Mr. Chas. Lambert)	1	18,297.78		
x-Blyth	1			7180,000.00
Bowmanville	1	5,000.00		
Bowmanville (Mr. J.J. Flett)	1	1,335.00		
Bradford	3	36,300.00		
Bradford (Luxury Home Builders Ltd.).....	1	23,580.00		
Brampton	1	12,124.92		
x-Brampton & Chinguacousy Township.....	1		71,100,000.00	
Brampton (Peel Village Develop- ments Ltd.).....	2	205,225.54		
(Wingold Realty Ltd., Toronto).....	1	75,070.86		
Brantford	15	721,625.00		
Brantford Twp. (J.N. Bennett Brant Ltd., Toronto).....	1		22,600.00	
(Brant County).....	1	7,000.00		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
Bridgeport	1	793,300.00		
x-Brighton	1			7160,827.00
Brockville	4	940,900.00		
Burlington	10	332,727.71		
x-Burlington	1	745,000.00		
x-Burlington	3	452,000.00	2,300,000.00	
<u>Burlington</u> (Monarch Construction Limited).....	1	30,700.00		
(Verhoeven Construction Limited).....	1	4,330.00		
Caledonia	1	71,418.60		
Calvert Twp.	1	11,365.00		
<u>Calvert Twp.</u> (Messrs. St.Denis & Hurtubise).....	1	5,024.00		
Capreol	1	5,137.00		
Chapleau Twp.	1	6,827.00		
Chatham	8	148,616.27		
Chelmsford	1	53,600.00		
x-Chelmsford	1	48,000.00		
x-Chesley	1	163,718.00	47,100.00	
Chinguacousy Twp.	2	38,800.00		
x-Chinguacousy Twp. and Town of Brampton	1		360,000.00	
<u>Chinguacousy Twp.</u> (Chinguacousy Country Club).....	1		16,960.00	
<u>Clinton Twp.</u> (Nipponia Home-for- Aged, Beamsville)...	1		8,000.00	
Cobourg	1	16,137.21		
<u>Cobourg</u> (Gray & Banks Ltd.)..	1	8,900.00		
Collingwood	2	163,500.00		
Collingwood	1	745,000.00		
Cornwall	2	96,008.96		
x-Cornwall	2	500,000.00	950,000.00	
<u>Cornwall</u> (St.Lawrence Seaway Authority).....	1		15,000.00	
x-Cumberland Twp.	2	26,520.00	7141,794.92	
<u>Cumberland Twp.</u> (Parks & Gardens Home Developments Ltd.)..	1	10,800.00		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
<u>Dawn Twp.</u>				
(Union Gas Company Ltd., Chatham)....	1			18,530.00
Delhi	2	22,617.00		
Dresden	1	5,725.00		
Dryden	1	32,662.58		
Dundas	3	160,252.00		
<u>Dundas</u>				
(Mr. Harold J. Yates)	1	11,000.00		
Dunnville	2	19,264.00		
x-Durham	1			255,000.00
<u>Elderslie Twp.</u>				
(Bruce Packers Ltd., Paisley).....	1		5,000.00	
Elmira	3	34,155.25	456,000.00	
x-Elmvale	2			137,330.00
x-Emo Twp.	1			118,000.00
x-Englehart	2	4,185.00	82,065.00	
x-Espanola	1	30,680.00		
x-Essex	1			414,110.00
Etobicoke Twp.	94	3,415,041.78		
x-Exeter	1			267,365.00
<u>Ferris West Twp.</u>				
Ferris West Twp.	1	15,676.22		
(Ralphway Construct- ion Co., North Bay)..	1	21,220.45		
(Messrs. Justien & Kizell, North Bay)..	1	44,562.21		
(Pinewood Village Limited, North Bay).	1		7,095.00	
Fort Erie	2	10,580.00		
x-Fort Erie	1	238,000.00	453,000.00	
Fort William	2	51,521.05		
x-Fort William	3	76,000.00	1,525,000.00	
<u>Galt</u>				
x-Gananoque	1	391,000.00	214,000.00	
<u>Georgetown</u>				
(Georgetown Develop- ments Ltd.).....	1	194,116.58		
Goderich	2	5,963.00		
<u>Goderich</u>				
(Mr. Harold Share)..	1	4,900.00		
Gravenhurst	2	17,140.00		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
<u>Grimsby</u>				
(Mitchell General Contractors)....	1	23,669.00		
Grimsby N. Twp.	1	242,600.00	17,500.00	
Grimsby S. Twp.	1			267,300.00
Guelph	2	240,000.00		
Gwillimbury E. Twp.	3	37,096.00		
Hagersville	1	47,600.00		
Hamilton	17	3,519,110.34		
<u>Hamilton</u>				
(Messrs. Nowakowski & Stacey)	1	15,530.00		
<u>Hamilton (Sunshine Homes Ltd.)</u>	1	16,800.00		
(W. Grisenthwaite Developments Ltd.)	1	107,000.00		
(Builders Realty)...	1	78,150.00		
(Ptak Construction Company).....	1	11,000.00		
(Mr. J.E. Steinberg)	1	850.00		
(Queenston Develop- ment Co.Ltd.).....	1	29,720.00		
(Dundana Homes Ltd.)	1	15,800.00		
(Abbotsford(Prop- erties)Hamilton Ltd.)	1	49,150.00		
(Messrs. Peter & Herman Turkstra).....	1	7,100.00		
(Messrs. Gage, Gage & Christmas).....	1	20,957.00		
(Dartmouth Develop- ments Ltd.).....	1	45,430.00		
(Royal Botanical Gardens).....	1	8,605.00		
Hanover	1	51,150.00		
x-Harriston	1			189,944.76
Hawkesbury	2	41,978.00		
Hespeler	1	16,800.00		
Iroquois (H.E.P.C.)	2	50,000.00		
Kapuskasing	1	23,000.00		
Kemptville	1	3,700.00		
Kenora	1	92,000.00		
Kingston	12	425,047.90		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
<u>Kingston</u>				
(Dacon Construction Company).....	1	16,500.00		
x-Kingston Twp.	2		450,000.00	1,437,379.48
Kitchener	8	162,899.09		
x-Kitchener	3	450,000.00	1,681,410.00	
Korah Twp.	4	35,606.93		
x-Korah Twp.	1	339,850.00		
<u>Korah Twp.</u>				
(Hollingsworth Invest- ments Ltd.).....	1	114,622.80		
(Cabod Canadian Ltd.)	1	92,380.65		
(Mr. Frank DeSimon)	1	18,690.00		
x-Leamington	1		7941,275.00	
Leaside	2	102,000.00		
Levack	2	62,220.00		
Lindsay	1	4,356.00		
x-Lindsay	2	229,698.00	154,302.00	
x>Listowel	1	48,000.00		
London	12	1,086,547.25	7,632,100.00	
<u>London</u>				
(Fellner Construction Company).....	1	543,170.00		
(H.J. McClure Con- struction Co.)...	1	90,100.00		
(Eadie & Willcock Ltd.)	1	23,700.00		
(Upper Thames Develop- ment Limited)....	1	3,890.00		
(Scarlett Construction Company).....	1	25,200.00		
(Southcrest Estates Ltd.).....	1	226,024.52		
(Southwinds Development Ltd.).....	1	62,699.10		
(Sunrise Development Limited).....	1	85,275.79		
(Sifton Construction Co.Limited).....	2	394,713.67		
Longlac I.D.	1	1,410.00		
x-L'Orignal	1			7239,500.00
x-Lucan	1			7277,600.00
Manitouwadge I.D.	1	10,500.00		
Marathon I.D.	1	18,365.00		
Markham	4	79,673.00		
<u>Markham</u>				
(Northgate Developments Ltd.).....	1	11,305.00		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
Markham				
(Cotswald Estates Ltd.)	1	28,506.95		
Markham Twp.	2	56,327.00		
x-Markham Twp.	6	633,424.70		
Markham Twp.				
(Wycliffe Homes Ltd.)	1	80,006.51		
(Mr. R.D. Jackson, Thornhill).....	1	8,200.00		
(Mr. George Slightham)	1	41,635.00		
x-Michipicoten Twp. (Wawa Townsite).....	1	201,460.00	85,000.00	
Midland	3	26,477.61		
x-Milverton	1			7248,700.00
Mimico	1	977.50		
x-Moore Twp. (P.V. of Corunna).....	2			854,821.00
Nassagawega Twp.				
(Ontario Jockey Club Ltd., Downsview)....	1		43,100.00	
Neelon & Garson Twps.				
(Mr. E.C. Racicot)....	1	5,871.80		
Nepean Twp.	1	20,014.50		
Nepean Twp.				
(Campeau Construction Co. Ltd., Ottawa)....	1	109,172.00		
(T.F.S. Realty Co. Ltd., Ottawa).....	1	81,617.00		
(Skyline Realty, Ottawa).....	1	138,600.00		
(Mr. Alvin Stewart, City View).....	2	21,380.00		
(Merivale Developments Ltd., Ottawa).....	2	272,041.00		
(Minto Construction Co. Ltd., Ottawa).....	2	506,644.27		
x-New Hamburg	3	175,900.00		
Newmarket	5	20,544.00		
x-Newmarket	3	183,195.00		
x-Newmarket and East				
Gwillimbury Twp.	2	146,800.00	920,000.00	
New Toronto	1	4,400.00		
Niagara Falls	1		29,573.81	
Niagara Falls and Stamford Township...	1	1,975,100.00	3,092,500.00	
North Bay	1	9,278.76		
North Bay				
(Mr. Stanley Cerisano)	1	11,804.28		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
Oakville	13	144,261.81		
<u>Oakville</u> (Association of United Ukranian Canadians)...1			10,500.00	
<u>Ops Twp.</u> (Permanent Investment Corp.Ltd.,Toronto)...1				110,429.74
<u>Orangeville</u> (Loten Construction Co. Ltd.,Dundas).....1		1,760.00		
Orangeville	1	5,005.00		
Orillia	5	42,075.31	182,386.20	
Orillia and Orillia Twp.	2	19,976.40		
Oshawa	13	577,685.65	155,000.00	
Ottawa	77	3,786,621.00		
Ottawa-Eastview	1	1,508,900.00		
Owen Sound	2	3,967.85		
x-Owen Sound	3	341,000.00		
x-Pakenham Twp.	1			136,000.00
Paris	2	75,800.00		
x-Paris	1	3,924.36		
x-Parry Sound	1	383,545.00	230,000.00	
Pembroke	6	213,987.01		
Perth	3	269,500.00	161,000.00	
Peterborough	7	152,239.85		
Petrolia	1	2,000.00		
Pickering Twp.	1	77,370.00		
x-Pickering Twp.	1	7,000.00		
<u>Pickering Twp.</u> (Resources Land Co- operative Corp., Toronto).....2		649,944.22		
Picton	2	200.00	210,000.00	
Port Arthur	3	623,226.00		
x-Port Arthur	2	458,242.00	250,000.00	
<u>Port Arthur</u> (Forest Park Develop- ment Ltd.).....1		94,200.00		
(Headway Builders Ltd.).....1		5,846.00		
Port Colborne	6	151,433.46		
x-Port Colborne	3	256,500.00		
x-Powassan	2		62,000.00	
Preston	3	52,018.29		
x-Rayside	1			418,000.00

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
<u>Red Lake Twp.</u>				
(Ontario Department of Public Works)..	1		45,000.00	
x-Richmond Hill	1	460,000.00		
Riverside & Sandwich East Twp.....	2	910,050.00	1,438,260.00	
Rockcliffe Park.....	1	3,411.60		
x-Rockland	1			4252,400.00
St. Catharines	4	101,070.31		
x-St. Catharines	3	519,500.00		
St. Catharines (Keistan Estates Ltd.)	1	11,485.00		
St. Thomas	6	173,570.00		
x-Saltfleet Twp.	1	4539,908.58		
x-Saltfleet Twp.	1	259,233.00		
Sandwich East Twp.	2	59,402.00		
Sandwich West Twp.	5	415,718.00	4684,600.00	
Sandwich West Twp. and City of Windsor	1	5,527.00		
Sandwich West Twp. (Mr. Archie Rose)..	1		21,200.00	
(Mr. Gene Thibodeau)	1		27,000.00	
Sarnia	6	1,086,500.00		
Sault Ste. Marie	6	140,500.00		
x-Sault Ste. Marie	1	5,865.00		
Sault Ste. Marie (Hollingsworth Invest- ments Ltd.).....	1	5,502.46		
(Algoma Steel Corp. Ltd.).....	1	4884,000.00		
Scarborough Twp.	41	3,980,487.04		
x-Seaforth	2	186,070.00		
x-Shelburne	2	131,000.00		
Shelburne Twp. (Ontario Department of Public Works)..	1		50,000.00	
x-Sidney Twp. (Batawa)	1	40,000.00	110,000.00	
Sidney Twp. (County Home for the Aged)	1	28,500.00		
x-Simcoe	3	111,000.00	660,000.00	
Simcoe (Gibson & Beckett Construction Co. Limited).....	1	30,000.00		
(Mr. Robert W. Laid- law).....	1	1,670.31		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
Smiths Falls	1	37,128.00		
Stamford Twp.	9	337,982.36		
Stamford Twp. and City of Niagara Falls....	1		11,535.75	
Stoney Creek (Malcolm Construction Ltd.)	1	20,092.00		
x-Stouffville	1		64,614.00	
Stratford	13	328,238.21		
Strathroy	1	58,000.00		
Streetsville (Reid Milling Co.)	1	10,300.00		
Sturgeon Falls	1	14,476.20		
Sudbury	12	2,465,580.91		
x-Sudbury	3	642,500.00		
Sudbury (Engineering & Develop- ment Ltd.).....	1	13,300.00		
(Trend Realty Co.)	1	16,555.21		
(Valleyview Subdivision Sudbury Ltd.)....	1	21,074.00		
(Sodi Land Ltd.)..	2	23,750.00		
(Destor Investments Limited).....	3	46,142.00		
(Barco Developments Limited).....	1	22,825.00		
(Mr. Ludger Michel)	1	2,928.00		
Tarentorus Twp.	2	43,182.25		
x-Tarentorus Twp.	1	187,550.00		
Teck Twp.	1	18,110.00		
x-Teeswater	1			7261,019.00
x-Thorold	2	7225,400.00		
Thorold Twp.	2	15,662.00		
x-Thorold Twp.	1	739,600.00		
Timmins	2	45,808.00		
x-Timmins	3	145,000.00	670,000.00	
Tisdale Twp.	3	39,943.00		
Toronto	33	2,468,941.49		
Toronto Metro	11	3,116,304.00		
Toronto Twp.	21	888,711.85		
x-Toronto Twp.	2	7870,550.00		
Toronto Twp. (Strong Arms Ltd., Port Credit).....	1	7,973.50		
(Dixie Construction Ltd., Cooksville).	1	30,161.50		

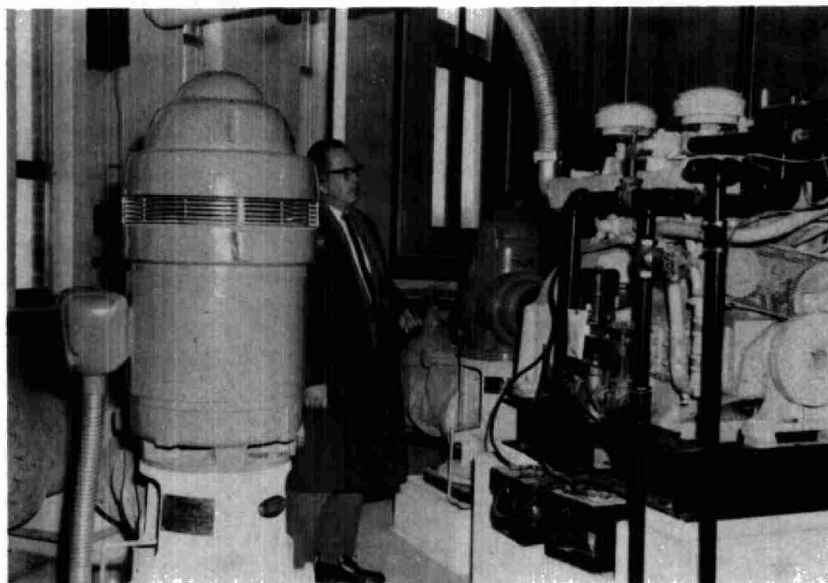
SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
(B.N.R. Development Ltd., Toronto)....	1	13,612.50		
(Applewood Development Ltd.).....	1	112,863.98		
(Lakeshore Investment Corp. Ltd., New Tor.)	1	35,606.00		
<u>Tottenham</u>				
(Mr. Clifford Abrams)	1	6,302.00		
Trenton.....	6	80,625.65		
x-Trenton.....	1	235,000.00		
Tweed	2	10,469.00		
Uxbridge	1		789,250.00	
x-Vankleek Hill	1			252,000.00
Vaughan Twp.	1		57,000.00	
Wallaceburg	1	6,000.00		
x-Wallaceburg	1	71,046,669.00	7358,500.00	
x-Waterdown	2			7534,000.00
x-Waterford	1			253,000.00
Waterloo	8	172,775.00		
Waterloo	1	7124,000.00		
x-Waterloo	1		22,000.00	
Welland	5	1,394,452.75		
<u>Westminster Twp.</u>				
(Caldwood Development Limited).....	1	117,400.00		
Weston	7	128,956.00		
Whitby	1	30,000.00		
Whitney Twp.	1	93,300.00	3,000.00	
Widdifield Twp.	1	42,903.00		
x-Widdifield Twp.	2	130,660.00		
<u>Widdifield Twp.</u>				
(Central Mortgage & Housing Corp.)	1	212,627.00		
(Dept. of National Defence, Ottawa)	1	38,000.00		
Windsor	2	2,501,896.00		
Wingham	1	18,126.00		
x-Wingham	2	7208,957.00	747,000.00	
Woodbridge	1			7450,000.00
Woodstock	2	125,222.00		
<u>Woodstock</u>				
(Bernard-Hoffman Ltd., London).....	1	69,810.00		

SEWAGE WORKS CERTIFICATES (Cont'd)

MUNICIPALITY	No. of Certi- ficates	Extensions to Existing Systems	Treatment and Disposal	New Systems
<u>Woodstock</u>				
(Huron Park Develop- ments).....	1	33,400.00		
York Twp.	2	47,150.00		
York East Twp.	2	35,500.00		
York North Twp.	70	6,567,875.26		
 TOTALS	 988	 \$66,493,593.54	 \$25,689,557.76	 \$3,928,069.98

x- OWRC project
 / preliminary approval only - included in total number of certificates
not included in total estimates



DIVISION OF WATER RESOURCES

A. K. Watt, Director
K. E. Symons, Assistant Director

The Ground Water and Surface Water branches of the division carried out water-resources investigations in many sections of the province while continuing with the inventory of basic, hydrologic data.

The staff numbered 28 at the end of December, an increase of four from the previous year. The apportionment of staff within the Division was as follows:

<u>Administration</u>	<u>Ground Water</u>	<u>Surface Water</u>
Director 1	Supervisor 1	Supervisor 1
Clerical 2	Geologists 5	Engineers 3
	Technicians 4	Technicians 3
	Inspectors 3	Clerical 2
	Clerical 3	

The activities of the Ground Water Branch were mainly involved with hydrogeologic surveys and investigations requested by municipalities and the assembling and compilation of hydrologic data obtained largely from well records submitted by drilling and boring contractors licensed by the Commission. The branch shared with the Surface Water Branch the task of handling applications for water permits which are required by most water users taking 10,000 gallons or more a day.

The work of the Surface Water Branch almost exclusively was related to the water-permit program. The staff of the branch was not up to complement at any time during the year and a great deal of time was spent in training new members.

In spite of this, worthwhile progress was made in assembling hydrometric and water-use data, particularly in areas where the competition for water was keen, and in the design of maps and procedures for handling the water-permit applications. A major accomplishment was the assessment of the problem related to irrigation by the flue-cured tobacco growers in the province and the efforts put forward to obtain their co-operation in managing the water resources of their areas by permit. In this undertaking, the co-operation of the Ontario Flue Cured Tobacco Growers Marketing Board was most helpful.

As the need to obtain a permit for the taking of water became more widely known, there was a marked increase in the number of applications for water permits and in the number of requests to investigate water interference. The accompanying table gives a summary of applications and permits handled during the year. A total of 1170 applications were received and 152 approvals granted in 1962 compared to 57 applications and 28 approvals in 1961.

Sixteen approvals were given for short term taking which in most instances was approved verbally and confirmed by letter.

Water taking approved by permit amounted to more than 35 million gallons a day. Over 1000 applications, almost entirely for tobacco irrigation, were under consideration at the end of the year pending the assembling of water-use and hydrometric data required for the processing of the applications.

If province-wide management of the province's water resources was to be carried out with the co-operation and support of the users, it would have to be done intelligently. Without supporting hydrologic data, the allotment of water by permit could not be made on any scientific basis. An attempt to manage the resource without having an inventory of it would become meaningless. Because there was a tremendous need for basic data on ground and surface waters in the province, plans for 1963 included the setting up of gauging stations on the smaller streams in the province where hydrometric data were almost completely lacking, and the equipping of additional wells for the observation of ground-water levels.

Although some work was carried out by both branches on the preparation of county water resources reports most of this work was delayed as a result of the pressure of the water permit program. Plans underway at the end of the year were expected to result in the steady processing of these reports in addition to the preparation of Water Resources Inventory Reports in 1963.

During the year, 15 papers were presented to various organizations by members of the division. The topics related to several aspects of the work of the division.

Meetings were held with members of various organizations for the purpose of discussing the effect of the water-permit-legislation on their activities. The organizations included the Ontario Road Builders' Association, Parks Branch and Conservation Authorities Branch of the Department of Lands and

Forests, Department of Highways, Federal Department of Agriculture, and several conservation authorities.

GROUND WATER BRANCH



The Ground Water Branch during 1962 was active in investigating and reporting ground-water conditions as they affected municipalities and individuals; supervising test-drilling and well-construction programs; continuing the collection, assembly, and distribution of basic, hydrologic data; and reviewing and processing applications for permits to take water from ground-water sources. The number of ground-water surveys carried out for municipalities increased but the number of test-drilling and well-construction projects declined. However, several of the test-drilling projects were extensive requiring supervision over prolonged periods. The number of permits and letters of approval

SUMMARY OF WATER PERMIT DATA

FOR 1962

USE	APPLICATIONS				APPROVALS			AMOUNTS OF TAKING APPROVED BY PERMIT ¹	
	CARRIED FORWARD FROM 1961	RECEIVED IN 1962	UNDER CON- SIDERATION DEC. 31/62	WITHDRAWN OR NOT REQUIRED	BY LETTER	BY PERMIT		GROUND WATER GPD	SURFACE WATER GPD
					GROUND & SURFACE WATER	GROUND & WATER	SURFACE WATER		
COMMERCIAL	1	39	2	3	3	15	17	3,017,000	855,840
INDUSTRIAL	3	36	7	6 ²	-	19	7	4,008,200	6,439,017
IRRIGATION	3	1026	979	13	-	16 ³	21 ⁴	4,014,200	4,881,640
MUNICIPAL	3	27	8	1	-	18	3	8,579,200	3,364,000
PUBLIC SUPPLY	1	5	1	2	-	2	1	73,200	124,500
RECREATION	-	25	7	1	-	-	17	-	-
PUMPING TEST	1	12	-	-	13	-	-	-	-
	12	1170	1004	26	16	70	66	19,691,800	15,664,997

1. THESE FIGURES DO NOT INCLUDE WATER TAKING APPROVED BY PERMITS WITH UNSPECIFIED AMOUNTS.

2. INCLUDES ONE APPLICATION FOR WHICH A PERMIT WAS REFUSED.

3. INCLUDES TWO PERMITS WHERE BOTH GROUND AND SURFACE SOURCES USED.

4. INCLUDES ONE PERMIT SUBSEQUENTLY CANCELLED.

dealt with increased markedly to 83.

The first water-well drillers' conference in the province was held at the Laboratory on March 29th and 30th under the sponsorship of the Commission. It was attended by 126 boring and drilling contractors and technical personnel from related fields.

In order to meet the requests for ground-water information more effectively, one geologist was added to the staff of the Branch, bringing the number of geologists to six. D. N. Jeffs was appointed Supervisor of the Branch during the year.

The main activities of the Branch are described below under major headings of Ground Water Surveys, Hydrologic Data, and Water Permits.

Ground Water Surveys

Ground-water surveys were the main activity for the geologists and their assistants. The surveys included 28 special investigations of a variety of problems relating mostly to pollution and possible interference between wells; 31 hydrogeologic surveys undertaken for municipalities; and supervision of 11 test-drilling and well-construction projects.

Special Investigations

There were 28 special investigations of a variety of problems related to ground-water use. Many of the problems involved only short field investigations but a few required extensive studies of field and office data.

Nine investigations involving a search for better water supplies for individuals and schools or the causes of highly mineralized well waters were carried out in the townships of East Flamborough, Esquesing, North Gower, Somerville, South Elmsley, Thorold, Vaughan, and Whitby and the Town of Smith's Falls.

Studies of the effects of contamination from wastes on ground-water conditions were made in the townships of Markham and Nepean.

Nine investigations of possible well interference were made in the Police Village of Hillsburgh; the Village of Cookstown; the towns of Burlington and Fergus, the townships of

Charlotteville, Vaughan, and Waterloo; and the Crumlin and White Oak areas in the vicinity of London. Steps to be taken to prevent interference with a spring supply were outlined in Vaughan Township. The control of flowing wells was investigated in the Village of Richmond and the Township of Waterloo.

Studies of hydrogeologic conditions relating to municipal water supplies were carried out at the Village of Point Edward and in Chinguacousy Township. An examination of ground-water conditions at Sibbald Provincial Park was carried out for the Department of Lands and Forests. The low water level in Green Lake in Caledon Township was investigated. Two pumping tests were supervised at Havelock in an effort to secure additional supplies of water.

Hydrogeologic Surveys

Ground-water surveys were undertaken, or reports of previous surveys completed, for 31 municipalities. Each field investigation, along with the preparation of the report and meetings and discussions with municipal officials, took from several days to several weeks of a geologist's time. The hydrogeologic reports prepared set forth the ground-water conditions of each locality and indicated the more favourable areas for test drilling.

The surveys were conducted for the following municipalities:

Townships of Blezard, Chapleau, Emo, Gloucester (Urbantale subdivision), Pickering (Whitevale area), Sidney (Batawa area), Southwold including the police villages of Fingal and Shedden, and Stanley (Varna area);

Police Villages of Ancaster, Angus, Bourget, Brigden, Dashwood, Granton, Moorefield, Plantagenet, St. Davids, and Warkworth;

Villages of Ailsa Craig, Bridgeport, Colborne, Milverton, South River, and Tottenham; and the Towns of Almonte, Burlington, Forest, Ingersoll, Preston, Tillsonburg, and Uxbridge.

Test-Drilling and Well-Construction Projects

The Commission entered into a test-drilling agreement with Deseronto and a well-construction agreement with Richmond Hill.

Ground-water surveys for these municipalities had been carried out in previous years.

Nine test-drilling and well-construction projects initiated prior to 1962 were supervised during the year. Several of the test-drilling projects were extensive programs requiring supervision over a prolonged period of time. The activities involved in this important phase of the Branch's work included the preparation of contract documents, the continual review of the hydrogeologic data obtained prior to and during the drilling program, the selection of drilling sites, and the provision of information and advice about the program to the local officials.

The following is a summary of the projects supervised by the Branch:

1. Projects continued from 1961:

Test drilling - Townships of Anson, Hindon, and Minden (Minden), Cumberland, Fauquier (Moonbeam), Gloucester (Orleans), McDougall (Nobel), and Pelham;

the Department of Municipal Affairs (Townsite of Brunetville) and the

Village of Eganville.

Well Construction - Town of Bradford.

One or more good well sites were located at Cumberland Township, Orleans, and Pelham Township and municipal wells were constructed at Bradford, Cumberland Township, Minden, Moonbeam, and McDougall Township. The results at Eganville were essentially negative; however, a small capacity well was left for use as an emergency source of supply.

2. Projects initiated in 1962:

Test drilling - Town of Deseronto.

Well construction - Town of Richmond Hill.

Options were secured for test-drilling sites at Deseronto; the contract was let for the work; but drilling had not started by the end of the year.

Land was secured for the construction of Municipal Well No. 5 at Richmond Hill, and a proposal for the construction of the well was invited.

Hydrologic Data

The collection and assembly of basic hydrologic data in the Branch is maintained through the licensing of drilling and boring, water-well contractors, and an observation-well program. These programs have been in operation since 1946 and have resulted in the accumulation of valuable data relating to geological and ground-water conditions throughout the province. The data are organized in the offices of the Branch for reference purposes.

The hydrologic data are in demand by government and municipal officials, consulting engineers, universities, drilling contractors, and companies operating in the field of water resources. In order to make the data more readily available, they are assembled and prepared for publication in bulletin form. The assembly for publication of hydrologic data for the years 1955-56 was completed at the end of the year.

Licensing Program

Four hundred and six licences were issued in 1962 for carrying on the business of boring or drilling wells for water. Eleven of the licences were held by boring contractors and the remainder by drilling contractors. Records for 10,638 wells were forwarded to the Branch by the drilling and boring contractors during the year. The very large number of wells is believed to be a result of the dry conditions in much of the province during parts of the year. The three inspectors visited the contractors on 1,318 occasions and made 9,313 checks on the locations of wells.

The first water-well drillers' conference in the province, held at the Laboratory on March 29th and 30th under the sponsorship of the Commission, was attended by 126 boring and drilling contractors and technical representatives from related fields. Members of the Ground Water Branch presented three papers on geology and pumping tests and took part in a panel discussion on well construction.

The Branch exhibited a display and presented two short talks on well construction, seals, and pump connections at the annual meeting of the Ontario Water Well Association held at the

fair grounds in Lindsay.

Charges laid against three persons for violations of the Act or regulations concerning water wells resulted in convictions. One driller and one borer pleaded guilty to charges of operating without a licence and were fined. One plumber pleaded guilty to violations of the regulations concerning pump connections and air vents, and was fined. A charge against another plumber for a violation of the regulations concerning pump installation was withdrawn after the violation had been corrected in consideration of the plumber's repeated hospitalization due to illness.

Observation Well Program

Water levels in 30 wells were being measured at the end of December, 1962, as part of the regular observation well program. Automatic recorders were used in 13 wells; steel tapes in 15 wells; and airline devices in 2 wells to secure these measurements.

In addition to this regular program, water levels were being measured in 16 wells where special data were required to study ground-water problems in different areas.

Water levels in two private wells in the Parkway area of Kitchener were measured in anticipation of lowered water levels due to the operation of a large, municipal well nearby. In the vicinity of the White Oak well field in Westminster Township south of the City of London, water levels were being measured in six wells; in two wells by automatic recorders; in two by airline readings; in one by steel tape; and in one by electrical device.

In Glanford Township west of Hamilton some water level measurements taken by tape were received on four public school wells in various parts of the Township.

At the proposed George Pittock damsite, north of the City of Woodstock in East Zorra Township, automatic recorders were set up to record water level measurements on two test wells; a tape was used on a third test well; and a special apparatus was used to measure the head on the fourth, a flowing well. These wells formed the nucleus for a network of wells being established to observe the effect of the dam and reservoir on ground-water levels in the area.

WATER RESOURCES DIVISION
GROUND WATER SURVEY
PROGRAM

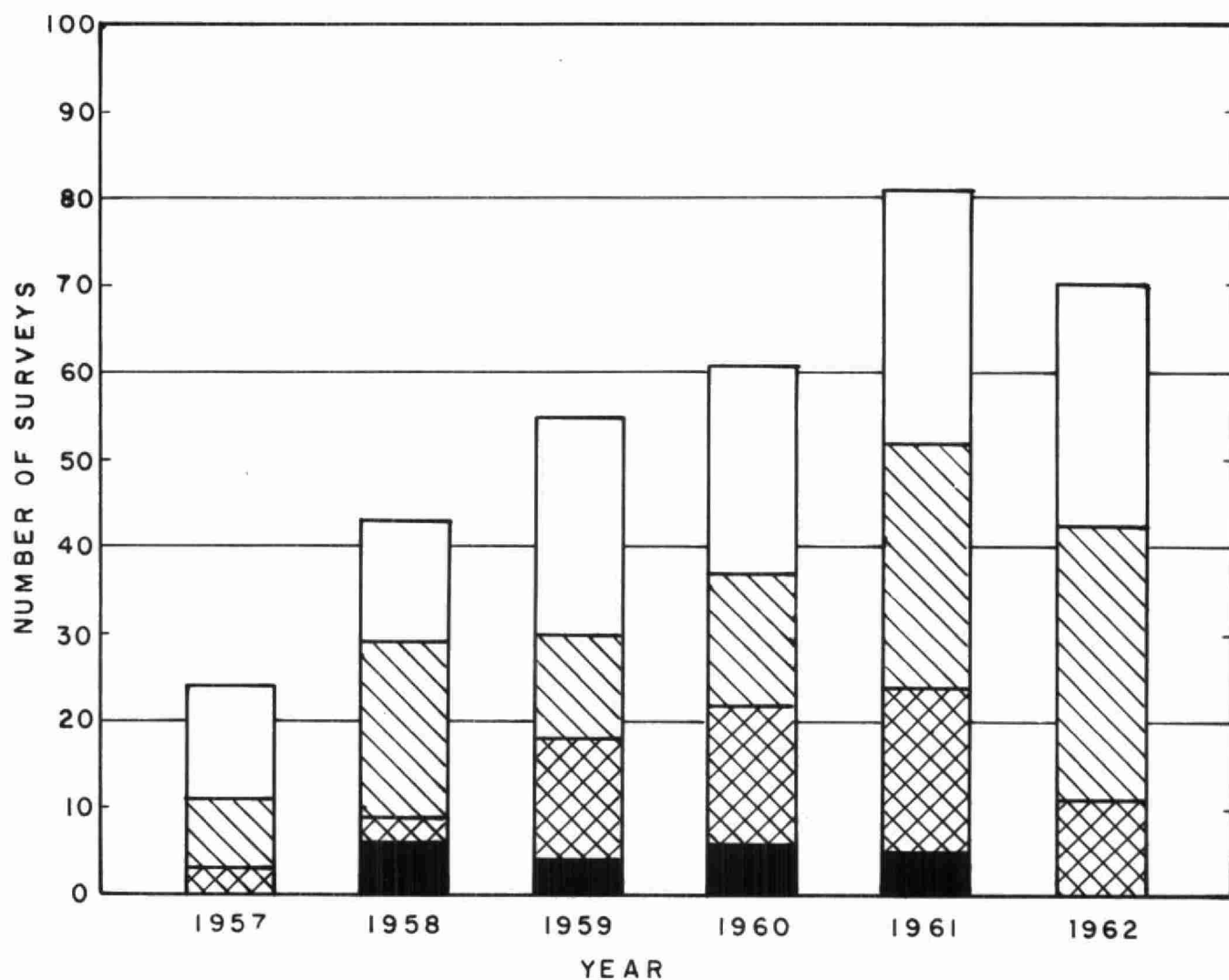






FIGURE I - TYPES OF SURVEYS

-  - SPECIAL INVESTIGATIONS
-  - MUNICIPAL HYDROGEOLOGIC SURVEYS
-  - WATER EXPLORATION PROGRAMS, OWRC PROJECTS
-  - COUNTY WATER RESOURCES SURVEYS

WATER RESOURCES DIVISION

**COLLECTION OF
BASIC HYDROGEOLOGIC DATA**

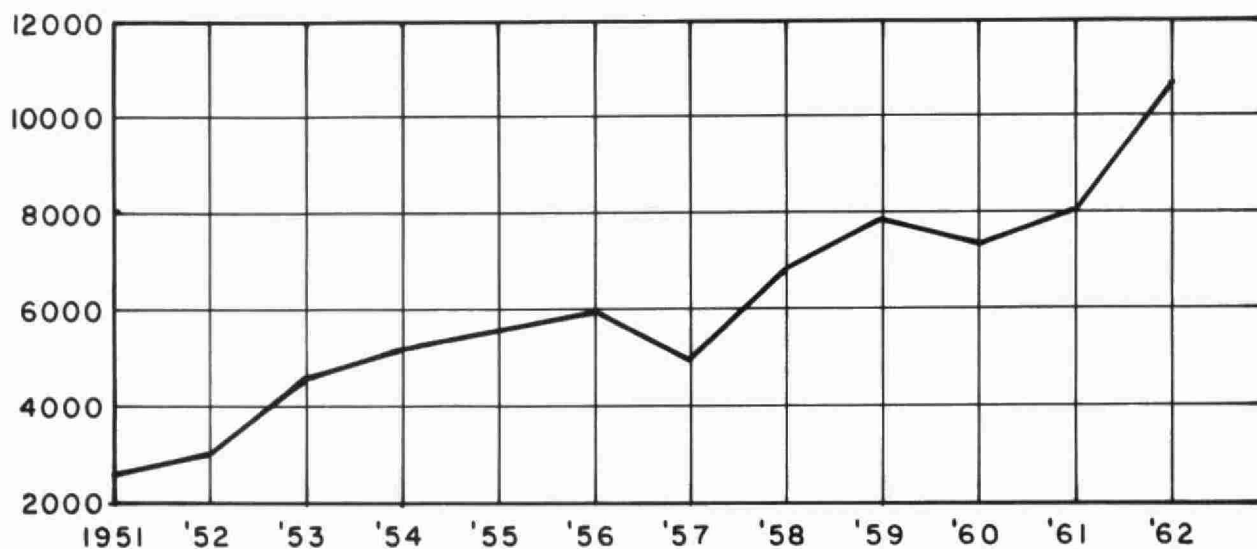


FIGURE 2 - NUMBER OF WATER WELL RECORDS
RECEIVED ANNUALLY

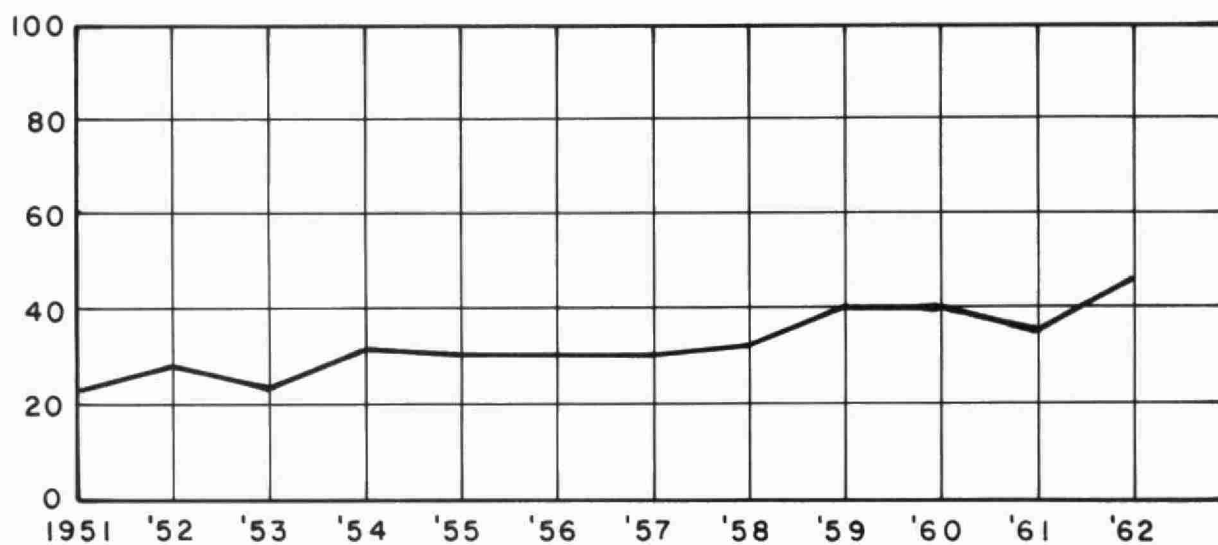


FIGURE 3 - NUMBER OF OBSERVATION WELLS

Water Permits

There was a sharp increase during 1962 in the number of permits issued for the taking of water from ground-water sources. Longer term takings were regulated by 70 permits authorizing the use of up to 19,691,800 gallons per day of ground water. Short term takings were approved for 12 pumping tests. Generally such approval was given verbally and confirmed by letter. Thirty-one applications were under consideration at the end of the year. Field conditions were examined in connection with the taking of water in the townships of Brantford, Chinguacousy, Pelham, Puslinch, and Toronto.

Special Projects

The compilation of data gathered previously in the water resources survey of East Zorra Township was resumed toward the end of the year. It was expected that some additional water samples would need to be collected for chemical analyses in order to provide a more complete picture of ground-water conditions in this rural area.

Members of the Branch presented a total of 11 papers on ground water and well construction during 1962. Most of these were given at meetings of persons directly involved in the construction or operation of wells.

SURFACE WATER BRANCH

The main work of the Branch was directly related to the management of water resources by the water-permit program. Some progress was made in the preparation of county-survey reports on water resources for which field work had been previously conducted. The development of new procedures and the training of new staff were significant aspects of the work.

In the water-permit program, field and office studies were carried out under the following categories: Consideration of applications for permits to take water; investigations of complaints concerning interference with water supplies; determination of available supplies of water by hydrometric surveys and analysis of records; and area surveys to determine the nature and extent of surface-water use within a drainage basin. Special attention was given to problem areas and particularly to areas where flue-cured tobacco is grown.

County Water Resources Surveys

Some progress was made towards the completion of Water Resources reports for the County of Welland and the County of Haldimand.

Industrial water-use data were assembled in report form for the County of Lincoln.

Water Permits Program

The work associated with the water-permit program increased tremendously during the year for this Branch. The number of parties requiring permits was increased by a change in the legislation which made most takings from surface sources by seasonally installed intakes or works subject to control by permit. Some 5,000 irrigators including an estimated 3,200 who grow flue-cured tobacco were thereby brought within the scope of the permit system. A particular effort was made to deal with this latter group.

The work was designed to obtain basic data on the available supply of water and on water use with special attention being given to areas where competition for the available supply was reported. The work is discussed below under the following headings: Applications and Permits, Complaints, Hydrometric Surveys, Survey of Irrigation of Tobacco, and Area Surveys.

Applications and Permits

The number of applications for permits to take water from surface sources was 1,036 in 1962. Of this number, 920 were for the purpose of irrigating flue-cured tobacco from surface sources other than the Great Lakes. Sixty-six permits were issued for the taking of water and in three instances, takings were authorized by letters of approval. Two applications were withdrawn and one permit was cancelled upon the advice of the permittee.

Permits were granted for purposes which included: road construction; irrigation of farm crops, pasture, commercial sod, and golf courses; storage of water to create a pond or a reserve of water for later withdrawal; and municipal, industrial, or commercial uses.

Field investigations were carried out for many of the applications for which permits were issued.

Complaints

An extended dry-weather period in late spring and early summer was responsible for low natural flows in many streams and increased water requirements for irrigation. The combination resulted in many complaints concerning interference with water supplies. Investigations of complaints were made on the following streams; Big Creek, Black Creek (East Gwillimbury Township), Bogart Creek, Clear Creek, Credit River, Dedrich Creek, Dingman Creek, Don River, Duffin Creek, Humber River, Lynde Creek, McKenzie Creek, Nottawasaga River, Oakville Creek, Rouge River, and the Thames River.

The most common complaints concerned interference with livestock-watering and irrigation requirements, reduced supply for water-power development, and alleged reduction of aesthetic values. Withdrawals of water for irrigation and improper filling of on-stream ponds were the most common causes of complaint.

In two cases, it was necessary to install automatic flow-recording equipment to obtain a continuous record of flows in order to assess the validity of the complaints. In others, complete studies of the available supply and all users were necessary.



Hydrometric Studies

One field party was busy throughout the summer making measurements and observations of stream flows. Their work was restricted to areas where tobacco is extensively grown and to problem areas. At some 553 stations, 440 stream-flow measurements were made and 229 no flow observations recorded. The watersheds and streams covered are tabulated below:

Watershed

Streams

Big Creek	Big Creek Brandy Creek Cranberry Creek	North Creek Trout Creek Venison Creek
Big Otter Creek	Big Otter Creek Branch Creek Little Otter Creek	Otter Creek Spittler Creek Stoney Creek
Black River	Black River	
Bronte Creek	Bronte Creek	
Catfish Creek	Bradley's Creek Catfish Creek	Nineteen Creek
Clear Creek	Clear Creek	
Dedrich Creek	Dedrich Creek	Mud Creek
Duffin Creek	Duffin Creek East Branch	West Branch
Fisher's Creek	Fisher's Creek	
Grand River	Big Creek Boston Creek Fairchild Creek	Horner Creek McKenzie Creek Nith River Rogers Creek
Humber River	West Branch of the Humber	
Kettle Creek	Dodd Creek	Kettle Creek
Lynde River	Lynde River	Carruthers Creek
Lynn River	Black Creek Kent Creek	Lynn River Patterson Creek
Nanticoke Creek	Nanticoke Creek	
Nottawasaga River	Bailey Creek Beeton Creek	Pine River
Oakville Creek	Oakville Creek	
Sandusk Creek	Dry Creek	Sandusk Creek

Watershed con'd

Streams con'd

Silver Creek	Silver Creek	
Sixteen Mile Creek	Ox Creek	
South Otter Creek	Hemlock Creek	South Otter Creek
Talbot Creek	Talbot Creek	
Thames River	Cruickshank Drain	North Branch Creek
	Dingman Creek	Sharon Creek
	Gregory Creek	Waubund Creek
	Medway Creek	Wye River
Young Creek	Young Creek	

Survey of Irrigation of Tobacco

In July letters were sent to some 4,000 growers of flue-cured tobacco advising them of the water-permit requirements and providing application forms. It was estimated that about 3,200 of these practise irrigation. Field offices were set up at Tillsonburg, Aylmer, and Delhi to assist growers with applications. Later, farm-to-farm field surveys were conducted in the small drainage basins of North Creek, Venison Creek and Dedrich Creek to obtain complete information on water use. As a result of these efforts, some 931 applications for taking water from inland sources were obtained. This represents about 30 per cent of potential applications. These applications will be considered when all applications for an area have been received.

Area Surveys

Special surveys of water uses were made for a number of streams in other parts of the province. These were prompted by complaints or by the need for additional information before an application could be properly considered. Surveys were made along the following streams: Bailey Creek, Beeton Creek, Black Creek (York County), Oakville Creek and the West Branch of the Humber River.

Other Activities

The Branch was represented at a number of conferences and conventions while papers or talks were presented at "The Flue-Cured Tobacco Growers Field Day" sponsored by the Department of

Agriculture, Canada, and "The Farm-Pond Field Day" sponsored by the Metropolitan Toronto and Region Conservation Authority.





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